M.E Communication System

S.No	Courses	Course Outcomes	Blooms Taxonomy Level
SEMESTER - I	MA4156: LINEAR ALGEBRA, PROBABILITY AND QUEUEING THEORY	**CO1:** apply various methods in Linear Algebra to solve the system of linear equations	K3
		CO2: use two-dimensional random variables, correlations and regression in solving application problem.	K3
		CO3: apply the ideas of Random Processes.	K3
		CO4: understand the basic characteristic features of a queueing system and acquire skills in analyzing queueing models.	K2
		CO5: apply the Simplex method for solving linear programming problems.	K3
	DS4152 : STATISTICAL SIGNAL PROCESSING	**CO1:** Analyze discrete time random processes	K4
		CO2: Apply appropriate model for estimation and signal modeling for the given problem	K3
		CO3: Analyze non-parametric and parametric methods for spectral estimation	K4
		CO4: Design optimum filter for the given problem	K6
		CO5: Design adaptive filters for different applications	K6
	EL4151: MODERN DIGITAL COMMUNICATION SYSTEMS	**CO1:** Differentiate coherent and non coherent receivers and analyse their performance under AWGN channel conditions	K4
		CO2: Illustrate the effect of signalling through bandlimited channels and Equalization techniques used to overcome ISI	K4
		CO3: Determine the channel capacity and design various block coding techniques to combat channel errors	K6
		CO4: Construct convolutional coders and analyze the performance of different decoding techniques.	K4
		CO5: Describe the basics of OFDM as a multicarrier communication and CDMA as a multiuser communication technique.	K1
	CU4151: ADVANCED WIRELESS COMMUNICATION	**CO1:** Analyze the wireless channel characteristics and identify appropriate channel models	K4
		CO2:Understand the mathematics behind the capacity calculation under different channel conditions	K2
		CO3: Understand the implication of diversity combining methods and the knowledge of channel	K2

		CO4: Understand the concepts in MIMO Communications	K2
		CO5: Understand mulitiple access techniques and their use in different multi-user scenarios.	K2
	CU4152: RADIATING SYSTEMS	**CO1:** Understand the fundamentals behind the different techniques in antenna technology.	K2
		CO2:Understand the challenges associated in designing antennas based on different technologies	K2
		CO3: Understand the capability and assess the performance of various antennas.	K2
		CO4: Identify the antennas specific to the applications, design and characterize.	K1
		CO5: Understand the need for optimizing in antenna design and the methodologies for the same.	K2
	EL4161 :DIGITAL COMMUNICATION SYSTEMS LABORATORY	**CO1:** Implement the adaptive filtering algorithms	K6
		CO2: Generate and detect digital communication signals of various modulation techniques using MATLAB.	K6
		CO3: Evaluate cellular mobile communication technology and propagation model.	K5
		CO4: Apply mathematical formulation to analyze spectrum estimation of a signal and bit rate determination of a transmission link	K3
		CO5: Analyze the performance of optimization algorithms for equalizing the channel or noise/echo cancellation	K4
		CO6: Able to design synchronization algorithm for Digital Communication systems	K6
	CU4161: ADVANCED DIGITAL SIGNAL PROCESSING LABORATORY	**CO1:** Generate deterministic/Random sequences using simulation tool	K6
		CO2: Design and analyze the frequency response of FIR/IIR digital filters for the given specifications	K6
		CO3: Estimate power spectrum of the given random sequence using parametric/nonparametric estimation methods	K2
		CO4: Implement adaptive filters using LMS/RLS algorithm	K6

		CO5: Analyze the discrete time systems at various sampling rates	K4
SEMESTER – II	**CU4251: RF SYSTEM DESIGN**	**CO1:** understand the specifications of transceiver modules	K2
		CO2: understand pros and cons of transceiver architectures and their associated design considerations	K2
		CO3: understand the impact of noise and amplifier non-linearity of amplification modules and also will learn the resultant effect during cascade connections	K2
		CO4: get exposure about spurs and generation principles during signal generation and frequency translations	K4
		CO5: understand the case study of transceiver systems and aid to select specification parameters	K2
	CU4201: MICROWAVE INTEGRATED CIRCUITS	CO1 : understand the concepts of planar transmission line	K2
		CO2: Design impedance matching circuits using LC components and stubs.	K6
		CO3: Design and analyze microwave components.	K6
		CO4: Perform stability analysis and be able to design amplifiers and oscillators at microwave frequencies.	K6
		CO5: Perform simulations, fabricate and test microwave devices.	K3
	CU4202: ADVANCED WIRELESS NETWORKS	**CO1:** get an exposure to the latest 4G networks and LTE	K4
		CO2: Understand about the wireless IP architecture and LTE network architecture.	K2
		CO3: know the adaptive link layer and network layer graphs and protocol.	K2
		CO4: Understand the mobility management and cellular network.	K2
		CO5: Understand the wireless sensor network architecture and its concept.	K2
	CP4252 :MACHINE LEARNING	**CO1:** Understand and outline problems for each type of machine learning	K2

		CO2: Design a Decision tree and Random forest for an application	K6
		CO3: Implement Probabilistic Discriminative and Generative algorithms for an application and analyze the results.	K4
		CO4: Use a tool to implement typical Clustering algorithms for different types of applications.	K3
		CO5: Design and implement an HMM for a Sequence Model type of application and identify applications suitable for different types of Machine Learning with suitable justification.	K6
	EL4071: ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY	CO1:Demonstrate knowledge of the various sources of electromagnetic interference	K6
		CO2:Display an understanding of the effect of how electromagnetic fields couple through apertures, and solve simple problems based on that understanding	K2
		CO3:Explain the EMI mitigation techniques of shielding and grounding	K1
		CO4:Explain the need for standards and EMC measurement methods	K1
		CO5:Discuss the impact of EMC on wireless and broadband technologies	K4
	MU4091: MULTIMEDIA COMPRESSION TECHNIQUES	CO1:Implement basic compression algorithms familiar with the use of MATLAB and its equivalent open source environments	K3
		CO2:Design and implement some basic compression standards	K6
		CO3:Critically analyze different approaches of compression algorithms in multimedia related mini projects.	K4
		CO4 : Understand the various audio,speech compression techniques	K2
		CO5 :Understand and implement MPEG video coding techniques.	K2
	CU4211: WIRELESS COMMUNICATION LABORATORY	**CO1:** The student would be able to design and conduct experiments to demonstrate the trade-offs involved in the design of basic and advanced coding and modulation techniques and the advanced baseband signal conditioning methods.	K6
		CO2: The student would be capable of applying communication engineering principles and design tools and will be well practiced in design skills.	K6
		CO3: The student would be able to comprehensively record and report the measured data, write reports, communicate research ideas and do oral presentations effectively.	K3

		CO4: The student would be capable of analyzing and interpreting the experimental measurement data and produce meaningful conclusions	K4
SEMESTER – III	**CU4301: OPTICAL COMMUNICATION AND NETWORKING**	**CO1:** demonstrate an understanding of the differences and challenges involved in the design of optical systems and networks.	K2
		CO2: apply his knowledge for designing a fiber optic system addressing the channel impairments.	K3
		CO3: Familiar with the architectures and the protocol stack in use.in optical networks and would be able to identify a suitable backbone infrastructure for our present and future communication needs.	K3
		CO4: understand how connections are managed in the network and the pros and cons of the different approaches	K2
		CO5: appreciate the need for network survivability and the methodologies used.	K4
	CU4076: VLSI FOR WIRELESS COMMUNICATION	**CO1:** Able to recollect basic wireless communication concepts	K4
		CO2: To understand the parameters in receiver and design a low noise amplifier	K6
		CO3: In a position to apply his knowledge on various types of mixers designed for wireless communication.	K3
		CO4: Design PLL and VCO	K6
		CO5: Understand the concepts of transmitters and utilize the power amplifiers in wireless communication.	K2
	DS4071: RADAR SIGNAL PROCESSING	**CO1:** perform radar signal acquisition and sampling	K4
		CO2: perform algorithm on radar processing	K6
		CO3 :design basic radar algorithm	K6
		CO4: design on aperture imaging and array processing	K6
		CO5: Illustrate theoretical results are derived and applied in practice	K4
	ET4251: IoT FOR SMART SYSTEMS	**CO1:** Analyze the concepts of IoT and its present developments.	K4
		CO2: Compare and contrast different platforms and infrastructures available for IoT	K2
		CO3: Explain different protocols and communication technologies used in IoT	K1
		CO4: Analyze the big data analytic and programming of IoT	K4
		CO5: Implement IoT solutions for smart applications	K5