

- **Department Name :-Electronics and Telecommunication Engineering**
- **UG Program Name :-B. Tech. Electronics and Telecommunication Engineering**
- **Vision and Mission :-**

<b>Vision</b>	Promote excellence in the field of Electronics & Telecommunication Engineering and allied areas through quality education and research to provide valuable assets for industry and society with global perspective
<b>Mission</b>	<ul style="list-style-type: none"> <li>• To provide quality education through industry ready curriculum, effective teaching learning process and state-of-art infrastructure to develop global competency.</li> <li>• To inculcate research aptitude leading to patents and publications in refereed journals.</li> <li>• To imbibe professional ethics, leadership skills, social, cultural &amp; environmental awareness with a passion for lifelong learning.</li> <li>• To strengthen relationships with industry, society, government bodies and alumni</li> </ul>

<b>Sr. No.</b>	<b>Program Outcomes</b>
1.	1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2.	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.	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.	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.	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.	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.	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.	8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9.	9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10.	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.	11. Project management and finance: Demonstrate knowledge and understanding of the Engineering and management principles and apply these to ones own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12.	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.

Sr. No.	Program Specific Outcomes
1.	Knowledge of Communication Engineering: Demonstrate the knowledge of communication engineering and its tools for the purpose of research, development and testing of main or subsystems in electronics domain.
2.	Knowledge of Embedded Systems: Integrate the hardware and programming for the development of embedded systems.
3.	Knowledge of Signal Processing: Analyze set of data in the form of various kinds of signals for the purpose of research, design and development of electronic systems.

Sr. No.	Semester	Course Code	Course Name	Course Outcome
1	I	EC2053	Analog Communication	CO:1 Describe different communication systems
				CO:2 Solve problems based on various communication systems
				CO:3 Analyze different modulation-demodulation techniques
				CO:4 Evaluate performance parameters of communication systems
				CO:5
2	I	EC2133	Analog Communication lab	CO:1 Demonstrate different modulation and demodulation waveforms in time and frequency domain.
				CO:2 Analyse different modulation-demodulation techniques
				CO:3 Interpret result and prepare report
				CO:4
				CO:5
	III	EC2012	Electronics Devices	Describe fundamentals of semiconductor devices
				Explain working principle of various solid state devices
				Illustrate various applications of electronics devices
				Analyze different biasing circuits and frequency models

			EC2032	Digital System Design	State fundamental knowledge of digital design
					Apply knowledge for real-time application
					Illustrate combinational and sequential circuits
					Design combinational and sequential circuits
			EC2052	Analog Communication	1. Describe the basic concepts of communication systems.
					2. Solve problems based on different communication signals.
					3. Develop simple systems for generating and demodulating am and fm signals.
					4. Explain different types of pulse modulation systems.
					5. Compare the performance of various modulation systems
			EC2072	Network Theory	Analyze ac & dc circuits
					Illustrate resonance in series & parallel circuit
					Calculate different parameters of electrical circuits
					Design analog passive filters & attenuators
			SH2112	Engineering Mathematics III	Build and test circuit as per the requirement
					Observe and plot the frequency response of amplifier
					Interpret results of experiment and compared with measured values
					Communicate results and observations and write report
			EC2092	Comprehensive Exam I	Demonstrate overall understanding of core subjects together.
					Manage time to solve critical problems in core subjects.
					Apply appropriate mathematical tools and techniques for quick analysis of the problem.
					Understand self intellectual level to prepare for future competitive exam.
			EC2112	Electronics Devices Lab	Build and test circuit as per the requirement
					Observe and plot the frequency response of amplifier

				Interpret results of experiment and compared with measured values
				Communicate results and observations and write report
		EC2132	Digital System Design Lab	Apply boolean laws/k-map-method to reduce a given boolean function
				Demonstrate the operation of combinational and sequential circuits for various practical applications
				Interpret results and compare with experimental values
				Communicate effectively through lab journals
		EC2152	Analog Communication Lab	Analyze & design simple analog communication systems
				Illustrate amplitude and frequency modulation and demodulation methods
				Draw different modulation and demodulation waveforms and frequency spectrums.
				Demonstrate different types of pulse modulation systems
				Conduct the experiments in group and write reports.

1	II	EC2083	Signals & Systems	CO:1 Describe mathematical description and representation of continuous time and discrete time signals & systems.
				CO:2 Determine the response of LTI systems using Convolution.
				CO:3 Apply knowledge of transform theory techniques for signal and system analysis.
				CO:4 Analyze signals and systems in frequency domain using Fourier transform.
				CO:5 Demonstrate use of MATLAB to manipulate signals and systems.
2	II	EC212	Linear Integrated Circuit & Applications	CO:1 Describe fundamentals of Linear Integrated Circuits.
				CO:2 Analyse different AC and DC parameters of Operational Amplifier.
				CO:3 Design various applications of Operational Amplifier.
				CO:4 Elaborate fundamentals and applications of special Integrated Circuits.

3	II	EC220	Linear Integrated Circuits & Applications Lab	CO:1 Analyze different parameters of various configurations of Op-Amp.
				CO:2 Design various applications of Op-Amp.
				CO:3 Interpret theoretical and practical results.
				CO:4 Communicate effectively through lab journals.
4	II	EC2042	Microcontroller	CO:1 Describe basic fundamentals of pic microcontroller
				CO:2 Write programs for pic microcontroller
				CO:3 Interface peripherals with pic microcontroller
				CO:4 Develop an embedded application using pic microcontroller
				CO:5
5	II	EC2142	Microcontroller Lab	CO:1 Install configure and utilize the mplab tool for pic microcontroller programming.
				CO:2 Write programs for pic microcontroller
				CO:3 Compile debug and test programs for pic microcontroller
				CO:4 Develop application using pic microcontroller
				CO:5

1	I	EC315	VLSI Testing & Verification	CO:1 Apply techniques to improve testability of VLSI circuits.
				CO:2 Use logic simulation methods, ATPG, BIST and boundary scan techniques in testing of VLSI circuits.
				CO:3 Analyze design of VLSI circuits by application of functional, timing and formal verification methods.
2	I	EC311	Information Theory and Coding	CO:1 Explain different concepts in information theory and coding.
				CO:2 Solve numerical on information theory, source coding and channel coding and error control coding.
				CO:3 Apply various theorems of encoding, error control etc. on signals.
				CO:4 Analyse various channel coding and error control techniques.
				CO:5

IV	CE2262	Engineering Mechanics	Identify various forces and their effects, to analyze real life problems
			Analyze engineering problems applying conditions of equilibrium
			Determine centroid & moment of inertia of the geometrical plane lamina
			Apply fundamental concepts of kinematics and kinetics to analyze practical problems
	EC2022	Analog Circuits	Interpret different parameters of various configurations of Operational Amplifier
			Analyze various applications of Operational Amplifier
			Explain various oscillators and active filters
			Illustrate waveform generators using special IC s
	EC2042	Microcontrollers	1. Describe basic fundamentals of pic microcontroller
			2. Write programs for pic microcontroller
			3. Interface peripherals with pic microcontroller
			4. Develop an embedded application using pic microcontroller
	EC2062	Digital Communication	Explain different concepts of digital communication systems
			Solve numerical on statistical theory, source coding & channel coding
			Apply various theorems of encoding, error control etc on signals
			Analyze various digital modulation and channel coding techniques
	EC2082	Signals and Systems	Classify continuous and discrete-time signals and systems
			Illustrate use of convolution and impulse response in lti systems
			Apply mathematical techniques to represent signals and systems
			Make use of transform theory techniques for system analysis
			Distinguish fourier techniques for frequency-domain analysis
	EC2102	Comprehensive Exam II	Demonstrate overall understanding of core subjects together.

			Mange time to solve critical problems in core subjects.
			Apply appropriate mathematical tools and techniques for quick analysis of the problem.
			Understand self intellectual level to prepare for future competitive exam.
	CE2282	Engineering Mechanics Lab	Identify various forces and their effects, to analyze real life problems
			Analyze engineering problems applying conditions of equilibrium
			Determine centroid & moment of inertia of the geometrical plane lamina
			Apply fundamental concepts of kinematics and kinetics to analyze practical problems
	EC2122	Analog Circuits Lab	Analyze different parameters of various configurations of Operational Amplifier
			Design various applications of Operational Amplifier
			Interpret theoretical & practical results
			Communicate effectively through lab journals
	EC2142	Microcontrollers Lab	1. install configure and utilize the mlab tool for pic microcontroller programming.
			2. write programs for pic microcontroller
			3. compile debug and test programs for pic microcontroller
			4. develop application using pic microcontroller
	EC2162	Digital Communication Lab	Calculate PDF, CDF, mean and variance of continuous and discrete random variables using simulation tool
			Demonstrate different modulation and shift keying techniques
			Write necessary reports and conduct the experiments in group
	SH2172	Environmental Science	Interpret impacts of human activities on natural resources and its control measure
			Apply ecological knowledge to solve environmental problems
			Select the appropriate technology to control environmental pollution

			Plan waste management and disaster management practices.
			Justify methods to assess impacts of developmental activities on environment.
			Analyze environmental change and its social impacts

V	EC3012	Digital Signal Processing	Relate effect of computation accuracy on performance of digital signal processing system
			Represent signals mathematically in continuous and discrete-time, and in the frequency domain.
			Analyze discrete-time systems using z-transform
			Describe the Discrete-Fourier Transform (DFT) and the FFT algorithms.
			Design digital filters for various applications.
	EC3032	Power Electronics	
			Discuss characteristics, ratings and drive circuits of the power devices
			Analyze the operation of power electronics converters, inverters and drives
			Determine performance parameters of the converters and inverters
			Design switching control circuit to meet desired specifications.
	EC3052	Product Design	
			Describe the stages of product design and development
			Apply various concepts for product design.
			Devise product testing methods.
			Explain the processes and importance of documentation.
	EC3072	Electromagnetic Waves & Antenna Theory	
			Apply the knowledge of vector algebra and co-ordinate system to formulate and solve electromagnetic field problems.
			Use and apply basics of electric and magnetic fields to solve the electrostatics and magnetostatics problems.
			Solve transmission line and Wave propagation problems.
			Explain basics of antennas.
	EC3092	Program Elective - I ECS_ ITC	
			Able to use Mathematics,investigate existing techniques-To have electronics systems

			Analyze coding techniques with mathematics using different software-To Demonstrate in systems
			Apply research based knowledge of coding.- To Analyze the system
			Analyze coding and error correction techniques considering ethical aspects and communicate effectively by demonstrating engineering principles with life long learning.-Demonstrate effectively
	EC3172	Program Elective - I CS	Identify different mathematical models of the control systems
			Design and analyze the system parameters to meet performance specifications in time and frequency domain.
			Comment on stability of control system using different methods
			Compare different control system and compensators
	EC3192	Comprehensive Exam III	Demonstrate overall understanding of core subjects together.
			Manage time to solve critical problems in core subjects.
			Apply appropriate mathematical tools and techniques for quick analysis of the problem.
			Understand self intellectual level to prepare for future competitive exam.
	EC3212	Digital Signal Processing Lab	Design and simulate the working of given digital signal processing techniques
			Describe techniques available for implementation of digital signal processing system
			Write relevant conclusion on the performance of designed digital signal processing system
			Present and write laboratory reports in desired format in grammatically correct language
	EC3232	Power Electronics Lab	Interpret v-i characteristics of power electronics devices
			Experiment power electronics converter for various conditions
			Design and test power electronic converter.

				Write report on the conduction of experimentation.
				Write, debug, and test basic cpp codes using the object oriented approaches introduced in the course.
				Discuss and analyze c++ problems in an object-oriented programming tool.
				Evaluate the performance of developed c++ program.
				Present and write laboratory reports in desired format in grammatically correct language.
				Measure and analyze the parameters of the different antennas
				Design and Simulate different types of Antennas using Electromagnetic Field solver
				Analyze the performance of the different types of antennas
				Demonstrate ability to work effectively in a team
				Develop thorough conceptual understanding and logical approach towards solving Aptitude and Reasoning problem.
				Write use of basic aptitude terms of percentage, average, ratios and application of business aptitude terms of profits and interests.
				Develop a bridge in analogies, series and visualizing directions.
				Demonstrate skills to use modern engineering tools, software, and equipment to solve real world problems.
				Apply knowledge of professional and ethical responsibilities.
				Communicate in verbal and written form.
				Write a detailed report on Summer Internship

Sr. No.	Semester	Course Code	Course Name	Course Outcome
1	I	EC4013		CO:1 Describe the networking concepts

			Computer Network	CO:2 Formulate Algorithms of error correction and congestion
				CO:3 Analyze the performance of the network by implementing various algorithms
				CO:4 Illustrate network security aspects.
				CO:5 Design network for specific application
2	I	EC4192	Computer Architecture	CO:1 Describe computer architecture concepts and mechanisms related to the design of modern processors, memories, and networks and explain how these concepts and mechanisms interact.
				CO:2 Evaluate various design alternatives and make a compelling quantitative and/or qualitative argument for why one design is superior to the other approaches.
				CO:3 Demonstrate the ability to implement and verify designs of varying complexity at the register-transfer-level.
				CO:4 Communicate with i/o devices and standard i/o interfaces.
				CO:5 Create new designs at the register-transfer-level and the associated effective testing strategies.
3	I	EC4132	Biomedical Electronics	CO:1 Analyze the biological processes like other electronic processes
				CO:2 Recognize the application of the electronic systems in biological and medical applications.
				CO:3 Signify the importance of safety aspects in the medical field

- **Department Name :-Electronics and Telecommunication Engineering**
- **UG Program Name :-M. Tech. Electronics**
- **Vision and Mission :-**

<b>Vision</b>	Promote excellence in the field of Electronics & Telecommunication Engineering and allied areas through quality education and research to provide valuable assets for industry and society with global perspective
<b>Mission</b>	<ul style="list-style-type: none"> <li>• To provide quality education through industry ready curriculum, effective teaching learning process and state-of-art infrastructure to develop global competency.</li> <li>• To inculcate research aptitude leading to patents and publications in refereed journals.</li> <li>• To imbibe professional ethics, leadership skills, social, cultural &amp; environmental awareness with a passion for lifelong learning.</li> <li>• To strengthen relationships with industry, society, government bodies and alumni</li> </ul>

<b>Sr. No.</b>	<b>Program Outcomes</b>
1.	<p>PO1:An ability to independently carry out research /investigation and development work to solve practical problems.</p> <p>PO2:An ability to write and present a substantial technical report/document.</p> <p>PO3:Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.</p> <p>PO4:Adapt professional, ethical and moral responsibilities.</p> <p>PO5:Use knowledge of Project Management and Finance to tackle administrative responsibilities.</p> <p>PO6:Explore ideas and engage in lifelong learning.</p>

<b>Sr. No.</b>	<b>Semester</b>	<b>Course Code</b>	<b>Course Name</b>	<b>Course Outcome</b>
1	I	EEE1175	Research methodology	CO:1 Formulate a research problem
				CO:2 Analyze research related information
				CO:3 Prepare and present research proposal/paper by following research ethics
				CO:4 Describe nature and processes involved in development of intellectual property rights
				CO:5

2	I	EEE1015	Industrial Automation	CO1. Explain the functions of components of industrial automation system
				CO2. Write PLC ladder programs for the given applications
				CO3. Interface the given I/O devices with the PLC module
				CO4. Design an automation system for industrial applications
				CO:5