

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

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| Vision | 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 |
| Mission | <ul style="list-style-type: none"> • To provide quality education through industry ready curriculum, effective teaching learning process and stateof-art infrastructure to develop global competency. • To inculcate research aptitude leading to patents and publications in refereed journals. • To imbibe professional ethics, leadership skills, social, cultural & environmental awareness with a passion for lifelong learning. • To strengthen relationships with industry, society, government bodies and alumni |

| Sr. No. | Program Outcomes |
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| 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 |

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| | 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 |
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| 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 |
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| | 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. | |
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| EC2112 | Electronics Devices Lab | Build and test circuit as per the requirement | |
| | | Observe and plot the frequency response of amplifier | |

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| | | | | Interpret results of experiment and compared with measured values |
| | | | | Communicate results and observations and write report |
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| | | 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 |
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| | | 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. |
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| 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. |

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| 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 |
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| 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. |
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| 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 |
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| | 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 |
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| | 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 |
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| | 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 |
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| 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. | |

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

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

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| 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. |
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| | 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. |
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| | 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. |
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| EC3092 | Program Elective - I ECS_ ITC | Able to use Mathematics,investigate existing techniques-To have electronics systems | |

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| | | 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 |
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| 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 |
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| 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. |
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| 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 |
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| 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. |

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| | | | Write report on the conduction of experimentation. |
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| | EC3235 | Object Oriented Programming using C++ Lab | 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. |
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| | EC3272 | Antenna Lab | 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 |
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| | SH3032 | Aptitude Training I | 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. |
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| | EC3292 | Summer Internship | 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 |
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| Sr. No. | Semester | Course Code | Course Name | Course Outcome |
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| 1 | I | EC4013 | | CO:1 Describe the networking concepts |

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| | | | Computer Network | CO:2 Formulate Algorithms of error correction and congestion |
| | | | Computer Network | CO:3 Analyze the performance of the network by implementing various algorithms |
| | | | Computer Network | CO:4 Illustrate network security aspects. |
| | | | Computer Network | 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. |
| | | | Computer Architecture | 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. |
| | | | Computer Architecture | CO:3 Demonstrate the ability to implement and verify designs of varying complexity at the register-transfer-level. |
| | | | Computer Architecture | CO:4 Communicate with i/o devices and standard i/o interfaces. |
| | | | Computer Architecture | 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 |
| | | | Biomedical Electronics | CO:2 Recognize the application of the electronic systems in biological and medical applications. |
| | | | Biomedical Electronics | 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 :-**

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|----------------|---|
| Vision | 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 |
| Mission | <ul style="list-style-type: none"> • To provide quality education through industry ready curriculum, effective teaching learning process and state-of-art infrastructure to develop global competency. • To inculcate research aptitude leading to patents and publications in refereed journals. • To imbibe professional ethics, leadership skills, social, cultural & environmental awareness with a passion for lifelong learning. • To strengthen relationships with industry, society, government bodies and alumni |

| Sr. No. | Program Outcomes |
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| 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> |

| Sr. No. | Semester | Course Code | Course Name | Course Outcome |
|----------------|-----------------|--------------------|----------------------|--|
| 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 |

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| 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 |