

Program Objectives

B.Tech. Electronics & Communication Engg.

(Under graduate programs offered by the department)

- 1. Name of the program: Bachelor of Technology in Electronics & Communication**
- 2. Program Specifications:**

School of Studies:	School of Engineering & Technology
Department:	Electronics & Communication Engineering
Program:	B.Tech.(Electronics & Communication Engineering) CBCS Scheme
Mode of Study:	Full time (Semester system) Class room teaching; experiential learning; Tutorials; experimental laboratory training; Project assignments;

Program Educational Objectives:

PEO1: The graduates of the department will be able to understand, analyse, design and implement the solution to the problems associated with their engineering skills.

PEO 2: The graduates will be able to Practice the ethics of their profession, consistent with social responsibility and develop their engineering design using problem solving skills for innovations in multi-disciplinary areas.

PEO 3: The graduates will be able to Communicate effectively and manage resources skilfully using their professional skills.

PEO 4: be receptive to new technologies and apply professional knowledge, competence through lifelong learning, practice, publications and other professional activities.

Program Specific Outcomes :

PSO1: The ability to absorb and apply fundamental knowledge of core Electronics and Communication Engineering subjects in the analysis, design, and development of various types of integrated electronic systems and be able to interpret and synthesize the experimental data leading to valid conclusions.

PSO2: Competence in using electronic modern IT tools (both software and hardware) for the design and analysis of complex electronic systems.

PSO3: Good adaptability to change work environment, good interpersonal skills as a leader in appreciation of professional ethics and societal responsibilities.

PSO4: Skills to apply the contextual knowledge to assess societal, environmental, health, safety, legal and cultural issues with professional ethics and function effectively to manage different Projects in a multidisciplinary environment.

Program Outcomes

On completion of program, the graduates will

- Ability to apply the knowledge of Mathematics, Science and Engineering in Electronics and Communications.
- Ability to Design & Conduct Experiments, as well as Analyze & Interpret Data.
- Ability to design a System, Component, or Process to meet desired needs with in realistic constraints such as Economic, Environmental, Social, Ethical, Manufacturability, and Sustainability.
- Ability to Identify, Formulate & Solve problems in the area of Electronics and Communications Engineering.
- An understanding of Professional and Ethical responsibility.
- An ability to communicate effectively.
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Course Objectives & Outcomes		
Course Name	Course Code	Course Objective & outcome
ELECTRONIC DEVICES	EC03TPC01	<p>Course Objectives: Students will try to learn: 1. To understand operation of semiconductor devices. 2. To understand DC analysis and AC models of semiconductor devices. 3. To apply concepts for the design of Regulators and Amplifiers 4. To verify the theoretical concepts through laboratory and simulation experiments. 5. To implement mini projects based on concept of electronics circuit concepts.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Understand the principles of semiconductor Physics 2. Understand and utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems.</p>
DIGITAL SYSTEM DESIGN	EC03TPC02	<p>Course Objectives: Students will try to learn: 1. To understand number representation and conversion between different representation in digital electronic circuits. 2. To analyze logic processes and implement logical operations using combinational logic circuits. 3. To understand characteristics of memory and their classification. 4. To understand concepts of sequential circuits and to analyze sequential systems in terms of state machines. 5. To understand concept</p>

		<p>of Programmable Devices, PLA, PAL, CPLD and FPGA and implement digital system using VHDL. 6. To implement combinational and sequential circuits using VHDL.</p> <p>Course outcomes: At the end of this course students will demonstrate the ability to 1. Design and analyze combinational logic circuits 2. Design & analyze modular combinational circuits with MUX/DEMUX, Decoder and Encoder. 3. Design & analyze synchronous sequential logic circuits 4. Use HDL & appropriate EDA tools for digital logic design and simulation</p>
SIGNALS & SYSTEMS	EC03TPC03	<p>Course Objectives: Students will try to learn: 1. To introduce students the concept and theory of signals and systems needed in electronics and telecommunication engineering fields. 2. To introduce students to the basic idea of signal and system analysis and its characterization in time and frequency domain.</p> <p>Course outcomes: At the end of this course students will demonstrate the ability to 1. Analyze different types of signal 2. Represent continuous and discrete systems in time and frequency domain using different transforms 3. Investigate whether the system is stable 4. Sampling and reconstruction of a signal</p>
NETWORK THEORY	EC03TPC04	<p>Course Objectives: Students will try to learn: 1. To explain the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis techniques. 2. To introduce students with the fundamental concepts in graph theory. 3. To analyze circuits in time and frequency domain. 4. To explain concepts of driving point and transfer functions, poles and zeroes of network functions. 5. To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Understand basics electrical circuits with nodal and mesh analysis. 2. Appreciate electrical network theorems. 3. Apply Laplace Transform for steady state and transient analysis. 4. Determine different network functions. 5. Appreciate the frequency domain techniques.</p>
MATHEMATICS – III	EC03TBS05	<p>Course Objectives: Students will try to learn: 1. To expand the given periodic function defined in the given range in terms of sine and cosine multiple of terms as a Fourier series. 2. To extremise the functional using integration technique. 3. To form and solve the partial differential equation using different analytical techniques.</p> <p>Course Outcomes:</p>

		At the end of this course students will demonstrate the ability to apply knowledge of complex variables, Laplace transform, Fourier transform and Differential equations for understanding and solving engineering Problems.
ENGINEERING ECONOMICS	EC03THS02	<p>Course Objectives: Students will try to learn: 1. To Analyze Cost/Revenue Data and Carry Out Make Economic Analyses in The Decision-Making Process 2. To Justify or Reject Alternatives/Projects on An Economic Basis.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Aware of the basic theoretical framework underlying the field of Microeconomics, Macroeconomics, Indian Economy, Public Finance etc. 2. Understand the operations of money and banking and their interaction with the rest of the economy 3. Realize how monetary forces operate through a multitude of channels — market, non-market, institutions and among others. 4. Have an understanding of the various issues/components of the Indian economy so that they are able to comprehend and critically appraise current Indian economic problems. 5. Understand the major developments in the Indian economy before Independence, at the time of Independence and during the post-Independence period</p>
CONSTITUTION OF INDIA	EC03TMC02	<p>Course Objectives: Students will try to learn: 1. To understand the need for a constitution. 2. To explain the role of constitution in a democratic society. 3. To list the key features of the constitution. 4. To appreciate the fundamental rights of the citizens of India.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability: 1. To enhance their knowledge about society and public welfare. 2. To become a responsible citizen and give an active & positive support in Indian democracy 3. Students will understand the importance of their duties towards the society and nation and be aware about their rights for their overall development</p>
ELECTRONIC DEVICES LAB	EC03PPC01	
DIGITAL SYSTEM DESIGN LAB	EC03PPC02	
ANALOG AND DIGITAL COMMUNICATION	EC04TPC05	<p>Course Objectives: Students will try to learn: 1. The fundamentals of basic communication system, types of noise affecting communication system and noise parameters. 2. Need of modulation, modulation processes and different amplitude modulation schemes 3. Different angle modulation schemes with different generation</p>

		<p>and detection methods. 4. Various radio receivers with their parameters. 5. Need of sampling and different sampling techniques. 6. Generation and detection of pulse modulation techniques and multiplexing. 7. About theoretical bounds on the rates of digital communication system and represent a digital signal using several modulation methods.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Analyze and compare different analog modulation schemes for their efficiency and bandwidth 2. Analyze the behavior of a communication system in presence of noise 3. Investigate pulsed modulation system and analyze their system performance 4. Analyze different digital modulation schemes and can compute the bit error performance.</p>
ANALOG CIRCUITS	EC04TPC06	<p>Course Objectives: Students will try to learn: 1. To understand the operation of the various bias circuits of MOSFET and Analyze and design MOSFET bias circuits. amplifier for a given specification..2. To understand the operation and design of multistage 3. To understand the operation and design of transformer coupled various types of power amplifier circuits. 4. To understand the effects of negative feedback on amplifier circuits. .5. To analyze the different RC and LC oscillator circuits to 6. To determine the frequency of oscillation.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Understand the characteristics of diodes and transistors 2. Design and analyze various rectifier and amplifier circuits 3. Design sinusoidal and non-sinusoidal oscillators 4. Understand the functioning of OP-AMP and design OP-AMP based circuits 5. Design ADC and DAC.</p>
MICROCONTROLLERS	EC04TPC07	<p>Course Objectives: Students will try to learn: 1. To develop background knowledge and core expertise of microcontroller. 2. To know the importance of different peripheral devices and their interfacing to microcontrollers. 3. To know the design aspects of microcontrollers. 4. To write assembly language programs of microcontrollers for various applications.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Do assembly language programming 2. Do interfacing design of peripherals like, I/O, A/D, D/A, timer etc. 3. Develop systems using different microcontrollers 4. Understand RSIC processors and design ARM microcontroller-based systems</p>
NUMERICAL METHODS	EC04TBS06	<p>Course Objectives: Students will try to learn: 1. To understand the method of solving algebraic, transcendental equations. 2. To determine the approximate value of</p>

		<p>the derivative & definite integral for a given data using numerical techniques.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Apply knowledge of numerical analysis for understanding, formulating and solving engineering Problems</p>
ELECTRONICS MEASUREMENT & INSTRUMENTATION	EC04TES05	<p>Course Objectives: Students will try to learn: 1. To explain basic concepts and definitions in measurement. 2. To describe the bridge configurations and their applications. 3. To elaborate discussion about the importance of signal generators and analyzers in Measurement.</p> <p>Course Outcomes: At the end of this course students will demonstrate the ability to 1. Measure low, medium & high resistances using suitable bridges. 2. Determine the value of inductor & Capacitor with the help of AC Bridges. 3. Test & Calibrate ammeter, voltmeter and wattmeter. 4. Understand the principles of various electronic instruments and transducers. 5. Measure frequency and phase in CRO.</p>
EFFECTIVE TECHNICAL COMMUNICATION	EC04THS03	<p>Course Objectives: Students will try to learn: 1. To participate actively in writing activities (individually and in collaboration) 2. To understand how to apply technical information and knowledge in practical documents 3. To practice the unique qualities of professional writing style, including sentence conciseness, readability, clarity, accuracy, honesty, avoiding wordiness or ambiguity, previewing. 4. To recognize, explain, and use the genres of technical communication: technical abstracts, data-based research reports, instructional manuals, technical descriptions, and web pages 5. To recognize and develop professional format features in print, html, and multimedia modes, as well as use appropriate nonverbal cues and visual aids.</p> <p>Course Outcomes: 1. At the end of the semester employability skill of students will get developed 2. Students will get improved their technical vocabulary & their accent. 3. Students will understand about technical communication strategies and personality skills. 4. Students will be able to write various technical scripts/letters.</p>
ANALOG AND DIGITAL COMMUNICATION LAB	EC04PPC03	
ANALOG CIRCUITS LAB	EC04PPC04	
MICROCONTROLLERS LAB	EC04PPC05	
LIC & ITS APPLICATIONS	EC5TPC07	<p>Course Objective: 1. To understand the concepts, working principles</p>

		<p>and key applications of linear integrated circuits. 2. To perform analysis of circuits based on linear integrated circuits 3. To design circuits and systems for particular applications using linear integrated circuits.</p> <p>Course Outcomes: After the completion of this course student will 1. Understand the fundamentals and areas of applications for the integrated circuits. 2. Analyze important types of integrated circuits. 3. Demonstrate the ability to design practical circuits that perform the desired operations. 4. Understand the differences between theoretical, practical & simulated results in integrated circuits. 5. Select the appropriate integrated circuit modules to build a given application</p>
COMMUNICATION SYSTEM – II	EC5TPC08	<p>Course Objectives: 1. To understand the key modules of digital communication systems with emphasis on digital modulation techniques. 2.To get introduced to the concept and basics of information theory and the basics of source and channel</p> <p>Course outcomes: 1. To familiar with the concept of digital communication. 2. To learn different digital modulation like PCM, DM, ADM including pulse modulation like PAM, PPM and also Time Division Multiplexing. 3. To learn different digital modulation techniques. 4. To introduce the concept of optimal reception of digital signal. 5. To familiar with the concept of information theory and also different coding scheme coding/decoding.</p>
ELECTROMAGNETIC FIELD THEORY	EC5TPC09	<p>Course objective: 1. To acquire the knowledge of Electromagnetic field theory that allows the student to have a solid theoretical foundation to be able in the future to design emission, propagation and reception of electro- magnetic wave systems 2. To identify, formulate and solve fields and electromagnetic waves propagation problems in a multidisciplinary frame individually. 3. To provide the students with a solid foundation in engineering fundamentals required to solve problems and also to pursue higher studies.</p> <p>Course outcomes: 1. To introduce the basic mathematical concepts related to electromagnetic vector fields. 2. To impart knowledge on the concepts of Electrostatic fields, electrical potential, energy density and their applications. Magneto static fields, magnetic flux density, vector potential and its applications. Different methods of emf generation and Maxwell's equations Electromagnetic waves and characterizing parameters 3. To introduce the concept of high frequency wave behaviour.</p>

MICROPROCESSOR & ITS APPLICATION	EC5TPE01	<p>Course Objective:</p> <ol style="list-style-type: none"> 1. Introduce the concept of microprocessor and its history and evolution with integration technology. 2. Introduce the concept of interfacing and also assembly language programming in 8085 and 8086. 3. Introduce the concept of architecture of microprocessor. <p>Course Outcomes:</p> <p>At end of the course, students will be able to: 1. Describe the general architecture of a microcomputer system and architecture & organization of 8085 & 8086 Microprocessor. 2. Understand and realize the Interfacing of memory & various I/O devices with 8085 microprocessors. 3. Understand and classify the instruction set of 8085 microprocessor and distinguish the use of different instructions and apply it in assembly language programming. 4. Understand the architecture and operation of Programmable Interface Devices and realize the programming & interfacing of it with 8085 microprocessors.</p>
DATA STRUCTURE & OPERATING SYSTEM	EC5TPE02	<p>Course Objective:</p> <ol style="list-style-type: none"> 1. To introduce the concept of Data Structure. 2. To introduce operating system as a resource manager, its evolutions and fundamentals. 3. To help student understand concept of process and different process (linear and concurrent) Scheduling policies. 4. To help student familiar with memory, file and I/O management policies. <p>Course Outcomes:</p> <ol style="list-style-type: none"> 1. To Learn linear data structures – lists, stacks, and queues 2. To understand sorting, searching and different algorithms 3. To apply Tree and Graph structures And also familiar with the operating system and memory concept and process management.
COMPUTER ARCHITECTURE	EC5TOE11	<p>Course Objective:</p> <ol style="list-style-type: none"> 1. Discuss the basic concepts and structure of computers 2. Understand concepts of register transfer logic and arithmetic operation 3. Explain different types of addressing modes and memory organization. 4. Learn the concept of pipeline architecture. 5. Summarize the Instruction execution stages. <p>Course Outcomes:</p> <ol style="list-style-type: none"> 1. To learn the basic structure and operations of a computer-based system 2. To learn the arithmetic and logic unit and implementation of fixed-point and floating-point arithmetic unit. 3. To learn the basics of pipelined execution. 4. To understand parallelism and multi-core processors. 5. To understand the memory hierarchies, cache memories and virtual memories.
OBJECT ORIENTED PROGRAMMING IN C++	EC5TOE12	<p>Course Objective:</p> <ol style="list-style-type: none"> 1. To learn advanced features of the C++ programming language as a continuation of the previous course. 2. To learn the characteristics of an

		<p>object-oriented programming language: data abstraction and information hiding, inheritance, and dynamic binding of the messages to the methods. 3. To learn the basic principles of object-oriented design and software engineering in terms of software reuse and managing complexity. 4. To enhance problem solving and programming skills in C++ with extensive programming projects.</p> <p>Course outcome:</p> <p>1. To understand Object Oriented Programming concepts and basic characteristics using C++. 2. To know the principles of packages, inheritance and interfaces 3. To define exceptions and use I/O streams 4. To design and build simple Graphical User Interfaces.</p>
INTRODUCTION TO INFORMATION SECURITY	EC5TOE13	<p>Course Objective</p> <p>This course focuses on the models, tools, and techniques for enforcement of information security with some emphasis on the use of cryptography. Students will learn information security from multiple perspectives.</p> <p>Course outcomes:</p> <p>1. Identify computer and network security threats, classify the threats and develop a security model to prevent, detect and recover from the attacks. 2. Develop SSL or Firewall based solutions against security threats, employ access control techniques to the existing computer platforms such as Unix and Windows NT. 3. Identify factors driving the need for information security</p>
PROJECT MANAGEMENT	EC5TOE14	<p>Course Objective:</p> <p>1. To make them understand the concepts of Project Management for planning to execution of projects. 2. To make them understand the feasibility analysis in Project Management and network analysis tools for cost and time estimation. 3. To enable them to comprehend the fundamentals of Contract Administration, Costing and Budgeting. 4. Make them capable to analyze, apply and appreciate contemporary project management tools and methodologies.</p> <p>Course outcomes:</p> <p>This course focuses on project management methodology that will allow students to initiate and manage projects efficiently and effectively. Student will learn key project management skills and strategies, and they will have the opportunity to apply this knowledge through assignments. Upon completion of the course, students will be able to: 1. Understand project management design, development, and deployment. 2. Use project management tools, techniques, and skills 3. Employ strategies to address the ubiquitous issue of resistance to change. 4. Align critical resources for effective project implementation. 5 Understand the</p>

		implications, challenges, and opportunities of organizational dynamics in project management. 6. Identify and use key performance metrics for project success. 7. Understand how to manage project cost, quality, and delivery. 8. Engage and lead effective project management teams in your organization. 9. Impart project management knowledge, tools, and processes to your colleagues. 10. Recognize and mitigate the early seeds of failure in the project life cycle.
RURAL TECHNOLOGY AND COMMUNITY DEVELOPMENT	EC5TOE15	<p>Course Objective: Objective of this subject is to introduce the concept of Rural development and community development in aspect of technology.</p> <p>Course Outcomes: 1. Understanding the concepts of Development 2. Theories of development in the context of Rural Development. 3. Indicators of Development & Rural Development and their measurements. 4. Recent advancement in Rural Development Theories. 5. Concept of sustainable rural development.</p>
LIC & ITS APPLICATION LAB	EC5PPC07	
MICROPROCESSOR & IT'S APPLICATION LAB	EC5PPE01	
COMMUNICATION SYSTEM-II LAB	EC5PPC08	
DIGITAL SIGNAL PROCESSING	EC6TPC10	<p>Course objective: The primary objective of this course is to provide a thorough understanding and working knowledge of design, implementation and analysis of DSP systems.</p> <p>Course outcomes: 1. This course introduces the concept of digital signal processing. 2. The course content includes the concept and the classification of discrete-time signal, representations of signals in time, frequency, z- and discrete frequency domains, representations and analyses of systems, and filter designs and also the application of DSP. 3. The course is a prerequisite course for further studying of other multimedia related courses, such as speech processing, image processing, audio and video data compressing, pattern recognition, communication systems and so forth.</p>
ANTENNA & WAVE PROPAGATION	EC6TPC11	<p>Course Objective: The main objective of the course of determination of the fields radiated from antennas; wire antennas; array antennas; parabolic reflectors; antenna radiation pattern; antenna directivity; effects of the lossy ground on the wave propagation.</p> <p>Course outcome:</p>

		1. To give insight of the radiation phenomena. 2. To give a thorough understanding of the radiation characteristics of different types of antennas. 3.To introduce the basic concept of antenna, array and design.
DATA COMMUNICATION & COMPUTER NETWORKING	EC6TPE03	<p>Course objective: 1. To introduce analysis and design concept of computer and communication networks. 2. To understand the network layered architecture and the protocol stack.</p> <p>Course outcomes: This course teaches the design and implementation techniques essential for engineering robust networks. Topics include networking principles, Transmission Control Protocol/Internet Protocol, naming and addressing (Domain Name System), data encoding/decoding techniques, link layer protocols, routing protocols, transport layer services, congestion control, quality of service, network services, Software Defined Networks (SDNs), programmable routers and overlay networks, wireless and mobile networking, security in computer networks, multimedia networking, and network management. network layered architecture and the protocol stack.</p>
FUNDAMENTAL OF VLSI DESIGN	EC6TPE04	<p>Course Objective: 1.To understand the fabrication process of CMOS technology 2. To teach fundamentals of VLSI circuit design and implementation using circuit simulators and layout editors. 3. To study various problems due to VLSI technology advancement. 4. To study digital circuits using various logic methods and their limitations. 5. To highlight the circuit design issues in the context of VLSI technology</p> <p>Course outcomes: 1. To introduce the concept of VLSI. 2.) To introduce the concept of MOS fabrication, MOS design and different MOS circuits. 3. To introduce the concept of VHDL.</p>
UNIX OPERATING SYSTEM	EC6TOE21	<p>Course objectives: Objective of this subject to familiarizes the students with concept, design and structure of UNIX operating system and also learn the file management.</p> <p>Course outcomes: 1. Explain basic unix concepts related to concurrency and control of programs and Identify and define key terms related to operating system 2. Capability to name and state the function of unix commands. 3. To introduce the concept of operating system. 4. To introduce the concept of file management including display, create and copy a file.</p>
PROBABILITY & STOCHASTIC PROCESS	EC6TOE22	<p>Course Objective: The main objective of this course is to provide students with the foundations of probabilistic and statistical analysis mostly used in varied applications</p>

		<p>in engineering and science like disease modeling, climate prediction and computer networks etc.</p> <p>Course outcomes:</p> <ul style="list-style-type: none"> • Learn the language and core concepts of probability theory. • Understand basic principles of statistical inference.
ADVANCED INSTRUMENTATION	EC6TOE23	<p>Course objective:</p> <ol style="list-style-type: none"> 1. To familiarizes the student with general concept of instrumentation and measurement. 2. To introduce the concept of Temperature and flow measurement. <p>Course outcome:</p> <ol style="list-style-type: none"> 1. Understand the calibration of various analytical instruments 2. Know analysis of using various analytical instruments. 3. To learn the concept of temperature and flow measurement. 4. To learn the general concept of instrument handling performance and behaviour analysis.
KNOWLEDGE MANAGEMENT	EC6TOE24	<p>Course Objective:</p> <ol style="list-style-type: none"> 1. Promoting enhanced knowledge dissemination within the organization with the help of internal as well as external learning processes and systems. 2. Transforming individual knowledge into the structural capital of the enterprise and organization. 3. Aligning business strategy with the existing core competencies of the organization and its capabilities. <p>Course outcomes:</p> <ol style="list-style-type: none"> 1. Knowledge creation at the level of the individual, group and organization. 2. The nature of technical problem-solving or Formulating knowledge 3. Explicit and codified knowledge 4. Tacit, implicit and sticky knowledge. 5. Technological versus pre-technological knowledge.
ENGINEERING SYSTEM DESIGN OPTIMIZATION	EC6TOE25	<p>Course Objective:</p> <p>Objective of this course to introduce 1. the multidisciplinary character of engineering systems, 2 design of these complex systems, and 3. Introduce the various concept of optimization.</p> <p>Course outcomes:</p> <ol style="list-style-type: none"> 1. Engineering systems modelling for design and optimization. 2. Selection of design variables, objective functions and constraints. 3. Overview of principles, methods and tools in multidisciplinary design optimization (MDO) for systems. 4. Subsystem identification, development and interface design. 5. Review of linear and non-linear constrained optimization formulations.
VHDL LAB	EC6PPE02	
DIGITAL SIGNAL PROCESSING LAB	EC6PPC06	
SEMINAR	EC6PSP01	
MICROWAVE ENGINEERING	EC7TPC12	<p>Course Objectives :</p> <p>Students will try to learn: 1. To understand Analysis</p>

		<p>of Waveguides and gain complete knowledge about Microwave Components. 2. Design of Impedance Matching and Tuning using lumped and distributed elements for network. 3. To Analysis and study characteristics of microwave tube Generators and Amplifiers. 4. To Analysis and study characteristics of microwave Semiconductor of detector, switch, generator and amplifier.</p> <p>Course Outcome: After completion of the course student will be able to: 1. Recognize the limitations of existing vacuum tubes and solid-state devices at microwave frequencies. 2. Study the performance of specialized microwave tubes such as klystron, reflex klystron, magnetron and Travelling wave tube. 3. Understand the operation of passive waveguide components. 4. Analyze microwave circuits using scattering parameters. 5. Test microwave components and circuits with standard microwave bench and vector network analyzer.</p>
WIRELESS & MOBILE COMMUNICATION	EC7TPC13	<p>Course Objectives: Students will try to learn: 1. To study the concept of Mobile radio propagation, cellular system design. 2. To understand mobile technologies like GSM and CDMA. 3. To know the mobile communication evolution of 2G, 3G and beyond in brief.</p> <p>Course Outcome: After completion of the course student will be able to: 1 Understand the evolution of cellular communication systems upto and beyond 3G 2 Design a cellular link and estimate the power budget. 3 Choose proper multiple accessing methods depending on channel model 4 Identify traffic channels for call processing CO5 Calculate key performance metrics of a cellular communication system.</p>
ADVANCE HARDWARE DESIGN	EC7TPE05	<p>Course Objective: Students will try to learn: 1. The architecture and operation of typical microprocessors and microcontrollers. 2. To familiarize the students with the programming and interfacing of microprocessors and microcontrollers. 3. To provide strong foundation for designing real world applications using microprocessors and microcontrollers.</p> <p>Course Outcome: After completion of course the student will be able to understand: 1 Describe the architecture of 8051 microcontroller and write embedded program for 8051 microcontrollers. 2 Design the interfacing for 8051 microcontrollers. 3. Select elements for an embedded systems t</p>
POWER ELECTRONICS	EC7TPE06	<p>Course Objectives: Students will try to learn: 1. The basic theory of power semiconductor devices and passive components, their practical applications in power</p>

		<p>electronics. 2. To familiarize students to the principle of operation, design and synthesis of different power conversion circuits and their applications. 3. To provide strong foundation for further study of power electronic circuits and system.</p> <p>Course Outcome: At the end of the course, a student will be able to: 1. Relate basic semiconductor physics to properties of power devices, and combine circuit mathematics and characteristics of linear and non-linear devices. 2. Describe basic operation and compare performance of various power semiconductor devices, passive components and switching circuits 3. Design and Analyze power converter circuits and learn to select suitable power electronic devices by assessing the requirements of application fields. 4. Formulate and analyze a power electronic design at the system level and assess the performance. 5. Identify the critical areas in application levels and derive typical alternative solutions, select suitable power converters to control Electrical Motors and other industry grade apparatus. 6. Recognize the role power electronics play in the improvement of energy usage efficiency and the applications of power electronics in emerging areas.</p>
WIRELESS SENSOR NETWORK	EC7TOE31	<p>Course Objectives: Students will try to learn: 1. To Understand the basic WSN technology and supporting protocols, with emphasis placed on standardization basic sensor systems and provide a survey of sensor technology 2. Understand the medium access control protocols and address physical layer issues 3. Learn key routing protocols for sensor networks and main design issues 4. Learn transport layer protocols for sensor networks, and design requirements 5. Understand the Sensor management, sensor network middleware, operating system.</p> <p>Course Outcome: At the end of the course the student will be able to understand: 1. Identify the components of Wireless Sensor Networks 2. Understand the challenges in network coverage and routing for energy efficiency 3. Define node Architecture for specific applications 4. Program sensor network platforms using specialized operating system 5. Recognize upcoming challenges in Sensor Networks.</p>
INFORMATION THEORY AND CODING	EC7TOE32	<p>Course Objectives: Student will try to learn: 1. To equip students with the basic understanding of the fundamental concept of entropy and information as they are used in communications. 2. To enhance knowledge of probabilities, entropy, measures of information. 3. To guide the student through the implications and consequences of fundamental theories and laws of</p>

		<p>information theory and coding theory with reference to the application in modern communication and computer systems.</p> <p>Course Outcome: After completion of the course, the student is able to 1: Design the channel performance using Information theory. 2: Comprehend various error control code properties 3: Apply linear block codes for error detection and correction 4: Apply convolution codes for performance analysis & cyclic codes for error detection and correction. 5: Design BCH & RS codes for Channel performance improvement against burst errors.</p>
NANOTECHNOLOGY	EC7TOE33	<p>Course Objectives: Student will try to learn: 1. To foundational knowledge of the Nano science and related fields. 2.To make the students acquire an understanding the Nano science and Applications 3. To help them understand in broad outline of Nano science and Nanotechnology.</p> <p>Course Outcome: At the end of the course, the student will be able to: 1. Understand the properties of Nano-materials and applications 2. Apply chemical engineering principles to Nano-particle production 3. Solve the quantum confinement equations. 4. Characterize Nano-materials. 5. Scale up the production Nanoparticles for Electronics and Chemical industries.</p>
OPTICAL INSTRUMENTATION AND MEASUREMENT LAB	EC7TOE34	<p>Course Objectives: Student will try to learn: 1. The different types of optical sources and their characteristics. 2. The different aspects of optical instrumentation. 3. Study about different optical sensors. 4. Different methods to calculate the various parameter for optical fibre.</p> <p>Course Outcome: After the successful completion of the course the students will be able to: 1. explain the basic concepts of optical transmitting and receiving.2. describe different opto- electronic devices 3. elucidate different methods of interferometry 4. describe selection of the appropriate optical fibre sensors for industrial application</p>
NEURAL NETWORK & FUZZY LOGIC SYSTEM	EC7TOE35	<p>Course Objectives: Students will try to learn: 1. Concepts and understanding of artificial neural networks 2. Fuzzy logic basic theory and algorithm formulation 3. To solve real world problems.</p> <p>Course Outcome: After completion of the course, the student will be able to 1: Comprehend the concepts of feed forward neural networks 2: Analyze the various feedback networks. 3: Understand the concept of fuzziness involved in various systems and fuzzy set theory. 4: Comprehend the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using</p>

		genetic algorithm. 5: Analyze the application of fuzzy logic control to real time systems.
MICROWAVE ENGINEERING	EC7TPPC12	
COMPREHENSIVE VIVA	EC7TPPE05	
PROJECT-I	EC7PSP02	
RADAR & SATELLITE COMMUNICATION	EC8TPC14	<p>Course Objectives: Student will try to learn: 1.The fundamentals of satellite communication. 2. To provide them with a sound understanding of how a satellite communication system successfully transfers information from one earth station to another. 3. Working principle of different RADAR systems and their applications.</p> <p>Course Outcome: After completion of subject, the student will be able to understand 1. the working principle of different RADAR systems and their applications. 2. Understand the Satellite fundamentals and types of satellite. 3. Explain the working of a Satellite communication system and its other subsystems. 4. Know the applications of Satellites in different areas.</p>
OPTICAL FIBER COMMUNICATION	EC8TPC15	<p>Course Objectives: Students will try to learn: 1. The basics of signal propagation through optical fibres, 2. Study about fibre impairments, components and devices and system design.</p> <p>Course Outcome: After completion of the course student will be able to: 1 Identify and characterize different components of an Optical Fibre Communication link. 2 Analyze optical source, Fibre and Detector operational parameters 3 Compute optical fibre link design parameters 4 Understand WDM, Optical Amplifiers, Optical Switching and networking technology concepts.</p>
VLSI FABRICATION METHODOLOGY	EC8TPE07	<p>Course Objective: Student will try to learn: 1.The basic MOS Circuits 2. the MOS Process Technology. 3. To understand the operation of MOS devices. 4.To impart in-depth knowledge about analog and digital CMOS circuits.</p> <p>Course Outcome: With the syllabus of this subject students can know the fabrication part of VLSI designing and also they can understand the methodology of VLSI.</p>
BASIC BUILDING BLOCKS OF MICROWAVE ENGINEERING	EC8TOE41	<p>Course Objective: Student will try to learn 1. Rectangular and circular wave guides using field theory. 2. The theoretical principles underlying microwave devices and networks. 3. To design microwave components such as power dividers, hybrid junctions, Directional Couplers, microwave filters, Microwave Wave-guides</p>

		<p>and Components, Ferrite Devices. 4. about Microwave Solid-State Microwave Devices and Microwave Tubes. 5. about Microwave Measurement Techniques.</p> <p>Course Outcome: After completion of course, the student will be able to understand: 1. Integrating a wide range of Microwave components into one design oriented frame work 2. Design and solve real world problems 3. Characterize microwave devices in terms of the directionality of communication. 4. Use a microwave test bench in analyzing various types of microwave measurements. 5. Measure the various parameters in microwave engineering. 6. An in-depth knowledge of applying the concepts on real time applications 7. Design & analyze the micro wave integrated circuits.</p>
PRINCIPLE OF MANAGEMENT	EC8TOE42	<p>Course Objectives: Student will try to learn: 1.The functions and responsibilities of managers. 2. To provide them tools and techniques to be used in the performance of the managerial job. 3. To enable them to analyze and understand the environment of the organization. 4. To help the students to develop cognizance of the importance of management principles.</p> <p>Course Outcome: On completion of this course, the students will be able to 1: Understand the concepts related to Business. 2: Demonstrate the roles, skills and functions of management. 3: Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions. 4: Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities.</p>
MOBILE COMPUTING	EC8TOE43	<p>Course Objective: Student will try to learn: 1. About the concepts and principles of mobile computing; 2. To explore both theoretical and practical issues of mobile computing. 3. To develop skills of finding solutions and building software for mobile computing applications.</p> <p>Course Outcome: Upon successful completion of this course, students will be able to understand: 1.the principles and theories of mobile computing technologies. 2.describe infrastructures and technologies of mobile computing technologies. 3.list applications in different domains that mobile computing offers to the public, employees, and businesses. 4. describe the possible future of mobile computing technologies and applications.</p>
EMBEDDED SYSTEMS	EC8TOE44	<p>Course Objective: Student will try to learn: The modern embedded systems and to show how to understand and program</p>

		such systems using a concrete platform built around. Course Outcome: After completion of the course student will be able to: 1. Identify the hardware and software components of an embedded system 2. Choose appropriate embedded system architecture for the given application 3. Write programs for optimized performance of an embedded system and validate
ADVANCED POWER ELECTRONICS	EC8TOE45	Course Objectives: Student will try to learn: 1. Selected areas of power electronics in greater depth. 2. Learn recent developments in power electronics. 3. in detail applications of power electronics. Course Outcome: After completion of the course, the student will be able to understand: 1. Competency in function of various power electronics devices 2. Skill of analyzing power electronic devices 3. Know-how of advance Power electronics converter 4. Competency in designing FACTS controllers. 5. Capability to design Active power filters.
OPTICAL FIBER COMMUNICATION LAB	EC8TPPC15	
ADVANCED RF AND MICROWAVE DESIGN LAB	EC8TPPC16	
PROJECT-II	EC8TPSP03	
COMPREHENSIVE VIVA	EC8TPSP04	