

**Course Outcomes: Students should be able to**

**First Year (FE)ELECTRONICS & TELECOMMUNICATION Engineering (Curriculum 2015 Pattern)  
Semester-I**

<b>Subject</b>	<b>Engineering Mathematics -I</b>
<b>Subject Code</b>	<b>ETC 101 (107001)</b>
<b>Course Outcome (COs)</b>	
ETC 101.1	formulate the wave equation in wave guide for analysis?
ETC 101.2	identify the use of microwave components and devices in microwave applications?
ETC 101.3	Carry out the microwave network analysis?
ETC 101.4	understand the working principles of all the microwave tubes?
ETC 101.5	understand the working principles of all the solid state devices?
ETC 101.6	To understand choose a suitable microwave measurement instruments and carry out th required measurements

<b>Subject</b>	<b>Engineering Physics</b>
<b>Subject Code</b>	<b>ETC102 (107002)</b>
<b>Course Outcome (COs)</b>	
ETC102.1	Students are enabled to derive the diffraction grating formula.
ETC102.2	Students are capable to Calculate the reverberation time of a room and suggest how to design a room with optimal reverberation time
ETC102.3	Students will be able to explain working principle of lasers.
ETC102.4	Ability to estimate the charge carrier mobility and density in intrinsic & extrinsic Semiconductor, PN Junction diode
ETC102.5	Students are capable to calculate the wavelength of a particle as a function of its momentum.
ETC102.6	Ability to explain different methods of growth and synthesis of nana particles and its application in Engineering.

<b>Subject</b>	<b>Engineering Graphics I</b>
<b>Subject Code</b>	<b>ETC 103(102006)</b>
<b>Course Outcome (COs)</b>	
ETC 103.1	Students will be able to develop the manual drawing skill, drawing interpretation skill.
ETC 103.2	Students will be able to develop the physical realization of the dimension & views of the objects.

ETC 103.3	Communication.
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<b>Subject</b>	<b>Basic Electrical Engineering</b>
<b>Subject Code</b>	<b>ETC 104(103004)</b>
<b>Course Outcome (COs)</b>	
ETC104.1	Relation between Voltage and Current
ETC104.2	Energy conversions
ETC104.3	Direction of Induced emf
ETC104.4	Transform of energy
ETC104.5	Understanding of a pure parameter
ETC104.6	Concept of three phase supply
ETC104.7	Response of element is identical with various sources

<b>Subject</b>	<b>Basic Civil &amp; Environmental Engineering</b>
<b>Subject Code</b>	<b>ETC 105(101005)</b>
<b>Course Outcome (COs)</b>	
ETC105.1	Understand the scientific terminologies related to civil engineering
ETC105.2	Familiarize with different components, equipment and technical of civil engineering materials of construction
ETC105.3	Describe the structure and function of an ecosystem.
ETC105.4	Explains the concept of built environment and its importance
ETC105.5	Explain the causes, effects and control measures of various types of pollutions.

<b>Subject</b>	<b>Fundamental of programming language -I</b>
<b>Subject Code</b>	<b>ETC 106(110003)</b>
<b>Course Outcome (COs)</b>	
ETC106.1	To learn & acquire art of computer programming.
ETC106.2	To know about some popular programming language and how to choose a programming language for solving a problem using a computer.
ETC106.3	To learn basics of Programming in C

<b>Subject</b>	<b>Workshop Practice</b>
<b>Subject Code</b>	<b>ETC 107(102006)</b>
<b>Course Outcome (COs)</b>	
ETC107.1	Introduction to different material in engineering practices with respect to their workability, formability & machinability with hand tools & power & to develop skills through hands on experience.

### Semester-II

<b>Subject</b>	<b>Engineering Mathematics II</b>
<b>Subject Code</b>	<b>ETC 108(107008)</b>
<b>Course Outcome (COs)</b>	
ETC108.1	Solve the differential equations by choosing proper method of solution.
ETC108.2	Solve the problems on orthogonal trajectories, simple electrical circuits, and heat flow by applying the methods of Ordinary differential Equations.
ETC108.3	Apply the properties of special functions to evaluate integral.
ETC108.4	Apply the properties of special functions to evaluate integral. Sketch the curve with full justification.
ETC108.5	Demonstrate knowledge and understanding of plane and solid geometry & use geometrical skills to solve simple real-world problems
ETC108.6	Evaluate double integral and change the order of the integration. Evaluate area bounded between two curves, mass of Lamina, moment of inertia.

<b>Subject</b>	<b>Engineering Chemistry</b>
<b>Subject Code</b>	<b>ETC 109(107009)</b>
<b>Course Outcome (COs)</b>	
ETC 109.1	Technology involved in improving quality of water for its industrial use.
ETC 109.2	Basic concepts of electro analytical techniques that facilitate rapid and reliable measurements.
ETC 109.3	Chemical structure of polymers and its effect on their various properties when used as engineering materials. To lay foundation for application the applications of polymers for specific applications and as composite materials.
ETC 109.4	Study of fossil fuel and derived fuels with its properties and applications.

ETC 109.5	An insight into carbon and hydrogen compounds with aspects of modern chemistry.
ETC 109.6	corrosion.

<b>Subject</b>	<b>Basic Mechanical Engineering</b>
<b>Subject Code</b>	<b>ETC 110(102013)</b>
<b>Course Outcome (COs)</b>	
ETC110.1	This Course will help the students to acquire knowledge of mechanical engineering.
ETC110.2	Describe the scope of mechanical engineering with multidisciplinary industries.
ETC110.3	Understand & identify common machine element with their functions & power transmission deviETCs.
ETC110.4	Learn conventional machine tools & understand the concept of design in mechanical engineering.
ETC 110.5	Impart knowledge of basic concept of thermodynamics applied to industrial applications.
ETC 110.6	Understand lying principles of energy conversion system & power plant.

<b>Subject</b>	<b>Engineering Mechanics</b>
<b>Subject Code</b>	<b>ETC 111(101011)</b>
<b>Course Outcome (COs)</b>	
ETC111.1	Apply fundamental knowledge of mathematics, science, and engineering.
ETC111.2	Design and conduct mechanics experiments.
ETC111.3	Analyze and interpret experimental and computational mechanics data
ETC111.4	Design a system, component or process to meet desired needs by synergistically combining mechanics of materials, fluid mechanics, and dynamics, when necessary.
ETC111.5	Identify, formulate, and solve engineering problems involving mechanics of rigid bodies.
ETC111.6	Effectively function as a member of multi-disciplinary technical team and engage in life-long learning.

<b>Subject</b>	<b>Basic Electronics Engineering</b>
<b>Subject Code</b>	<b>ETC 112(104012)</b>
<b>Course Outcome (COs)</b>	
ETC 112.1	Get knowledge of some basic electronic components and circuits
ETC 112.2	Understand basics of diodes and transistor circuits

ETC 112.3	Understand working of some IC based circuits
ETC 112.4	Analyze the logic gates and their usage in digital circuits
ETC 112.5	Expose the students to working of some power electronics devices, transducers and application of transducers
ETC 112.6	Understand the basic aspect of electronic communication systems

<b>Subject</b>	<b>Fundamental of programming language -II</b>
<b>Subject Code</b>	<b>ETC 113(110010)</b>
<b>Course Outcome (COs)</b>	
ETC113.1	To learn & acquire art of computer programming.
ETC113.2	To know about some popular programming language and how to choose a programming language for solving a problem using a computer.
ETC113.3	To learn basics of Programming in C , Advanced Programming.

<b>Subject</b>	<b>Engineering Graphics II</b>
<b>Subject Code</b>	<b>ETC 114(102006)</b>
<b>Course Outcome (COs)</b>	
ETC114.1	Students will be able to develop the computerized drawing skill, drawing interpretation skill.
ETC114.2	Students will be able to develop the physical realization of the dimension & views of the objects.
ETC114.3	Student will be able to develop imagination of Physical Objects to be represented on software.

**Course Outcomes: Students should be able to**

**Second Year (SE) ELECTRONICS & TELECOMMUNICATION Engineering (Curriculum 2015 Pattern)**

**Semester-I**

<b>Subject</b>	<b>SIGNALS AND SYSTEMS</b>
<b>Subject Code</b>	<b>ETC204( 204181 )</b>
<b>Course Outcome (COs)</b>	

ETC 204.1	Understand mathematical description and representation of continuous and discrete time signals and systems
ETC 204.2	Demonstrate mathematical analysis of LTI system using properties
ETC 204.3	Understand and resolve the signals in frequency domain using Fourier series
ETC 204.4	Study mathematical analysis of signals using Fourier transform
ETC 204.5	Study mathematical analysis of signals using Laplace transform
ETC 204.6	Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event

<b>Subject</b>	<b>Electronic Devices and Circuits</b>
<b>Subject Code</b>	ETC 202( 204182)
<b>Course Outcome (COs)</b>	
ETC202.1	Understand the behaviour of JEFET and analyze it under AC and DC operating Condition.
ETC202.2	Understand the behaviour of E MOSFET and analyse it under DC operating condition.
ETC202.3	Analyse small signal model of E MOSFET.
ETC202.4	Understand the MOSFET circuit.
ETC202.5	Understand and apply concept of feedback to improve stability of circuit.
ETC202.6	To Study the different types of voltage regulator.

<b>Subject</b>	<b>Electrical Circuits and Machines</b>
<b>Subject Code</b>	ETC201(204183)
<b>Course Outcome (COs)</b>	
ETC 201.1	Analyze basic AC & DC circuit for voltage, current and power by using KVL, KCL, and network theorems.
ETC 201.2	Explain the working principle of Transformer
ETC 201.3	Explain the working principle DC machine
ETC 201.4	Explain the working principle Induction Motor
ETC 201.5	Explain the working principle of BLDC & Universal Motor
ETC 201.6	Explain the working principle of Stepper & Single Phase Induction Motor

<b>Subject</b>	<b>Data Structures &amp; Algorithms (DSA)</b>
<b>Subject Code</b>	ETC205(204184)
<b>Course Outcome (COs)</b>	
ETC 205.1	Discuss the computational efficiency of the principal algorithms such as sorting & searching
ETC 205.2	Write and understand the programs that use arrays & pointers in C
ETC 205.3	Describe how arrays, records, linked structures are represented in memory and use them in algorithms
ETC 205.4	Implement stacks & queues for various applications
ETC 205.5	Understand various terminologies and traversals of trees and use them for various applications
ETC 205.6	Understand various terminologies and traversals of graphs and use them for various applications

<b>Subject</b>	<b>Digital Electronics</b>
<b>Subject Code</b>	ETC203( 204185 )
<b>Course Outcome (COs)</b>	
ETC 203.1	To understand the basic logic gates and various variable reduction techniques of digital logic circuit in detail & To understand, identify and design combinational circuits
ETC 203.2	To design, analyze and identify sequential circuits.
ETC 203.3	To design and implement hardware circuit to test performance and application for what it is being designed
ETC 203.4	To understand what is logic family.
ETC 203.5	To understand ,identify & design circuits using various PLD's
ETC 203.6	To understand the architecture and use of microcontrollers for basic operations and Simulate using simulation

<b>Subject</b>	<b>Electronic Measuring Instruments and Tools</b>
<b>Subject Code</b>	ETC206(204186)
<b>Course Outcome (COs)</b>	
ETC206.1	Understand fundamental of various electrical measurements.
ETC206.2	Understand and describe specifications, features and capabilities of electronic instruments
ETC206.3	Finalize the specifications of instrument and select an appropriate instrument for given measurement
ETC206.4	Carry out required measurement using various instruments under different setups

ETC 206.5	Able to compare measuring instruments for performance parameters
ETC 206.6	Select appropriate instrument for the measurement of electrical parameter professionally

<b>Semester-II</b>
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<b>Subject</b>	<b>Engineering Mathematics-III (EM-III)</b>
<b>Subject Code</b>	ETC208(207005)
<b>Course Outcome (COs)</b>	
ETC208.1	circuits
ETC208.2	processing
ETC208.3	Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing
ETC208.4	Perform vector differentiation and integration, analyze the vector fields and apply to Electro-Magnetic fields
ETC208.5	Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing

<b>Subject</b>	<b>Integrated Circuits</b>
<b>Subject Code</b>	ETC209( 204187 )
<b>Course Outcome (COs)</b>	
ETC209.1	To understand the characteristics of Op-Amp and identify the internal structure.
ETC209.2	To understand and identify various IC manufacturing techniques,& frequency response of op amp.
ETC209.3	To design, analyze and identify linear applications of Op-Amp.
ETC209.4	To design, analyze and identify nonlinear applications of Op-Amp.
ETC209.5	To understand and verify results (levels of V & I),D-A & A-D converters with hardware implementation.
ETC209.6	To Understand and apply the functionalities of PLL to Frequency synthesizer, multiplier, FM, and AM demodulators.

<b>Subject</b>	<b>Control Systems</b>
<b>Subject Code</b>	ETC210(204188)



<b>Course Outcome (COs)</b>	
ETC210.1	Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems
ETC210.2	Determine the (absolute) stability of a closed-loop control system.
ETC210.3	Perform time domain and frequency domain analysis of control systems required for stability analysis.
ETC210.4	Perform time domain and frequency domain correlation analysis
ETC210.5	Apply root-locus, Frequency Plots technique to analyze control systems
ETC210.6	Express and solve system equations in state variable form.

<b>Subject</b>	<b>Analog Communication</b>
<b>Subject Code</b>	ETC211(204189 )
<b>Course Outcome (COs)</b>	
ETC211.1	Understand, analyze and explain Amplitude modulation schemes
ETC211.2	Understand and explain techniques used in AM Receivers
ETC211.3	Understand, analyze and explain Angle modulation techniques, their analysis, bandwidth calculations
ETC211.4	Understand and explain techniques used in FM Receivers
ETC211.5	system
ETC211.6	Describe analog pulse modulation techniques and digital modulation technique.

<b>Subject</b>	<b>Object Oriented Programming (OOP)</b>
<b>Subject Code</b>	ETC 212 (204190)
<b>Course Outcome (COs)</b>	
ETC212.1	Describe the principles of object oriented programming
ETC212.2	Apply the concepts of data encapsulation, inheritance in C++
ETC212.3	Understand basic program constructs in Java
ETC212.4	Apply the concepts of classes, methods and inheritance to write programs Java
ETC212.5	Use arrays, vectors and strings concepts and interfaces to write programs in Java
ETC212.6	Describe and use the concepts in Java to develop user friendly program

<b>Subject</b>	<b>Employability Skill Development (ESD)</b>
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<b>Subject Code</b>	ETC 213(204191)
<b>Course Outcome (COs)</b>	
ETC213.1	Have skills and preparedness for aptitude tests
ETC213.2	Be equipped with essential communication skills (writing, verbal and non-verbal)
ETC213.3	Master the presentation skill and be ready for facing interviews
ETC213.4	Build team and lead it for problem solving

**Course Outcomes: Students should be able to**

**Third Year Electronics & Telecommunication Engineering (TE) (Curriculum 2015 Pattern)**

**Semester-I**

<b>Subject</b>	<b>Digital Communication (DC)</b>
<b>Subject Code</b>	ETC 301 (304181)
<b>Course Outcome (COs)</b>	
ETC 301.1	Understand working of waveform coding techniques and analyse their performance
ETC 301.2	Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency
ETC 301.3	Perform the time and frequency domain analysis of the signals in a digital communication system
ETC 301.4	Design of digital communication system
ETC 301.5	Understand working of spread spectrum communication system and analyze its performance

<b>Subject</b>	<b>Digital Signal Processing</b>
<b>Subject Code</b>	ETC 302 (304182)
<b>Course Outcome (COs)</b>	
ETC 302.1	Understand DSP Preliminaries and Applications
ETC 302.2	Analyze the discrete time signals and system using Fourier Transform
ETC 302.3	Analyze the discrete time signals and system using Z Transform
ETC 302.4	Design and implement IIR filters for filtering different real world signals.

ETC 302.5	Design and implement FIR filters for filtering different real world signals.
ETC 302.6	Develop different signal processing applications using DSP processor

<b>Subject</b>	<b>Electromagnetics</b>
<b>Subject Code</b>	ETC 303 (304183)
<b>Course Outcome (COs)</b>	
ETC 303.1	To introduce the basic mathematical concepts related to electromagnetic vector fields.
ETC 303.2	To impart knowledge on the concepts of electrostatics, electric potential, energy density and their applications
ETC 303.3	To impart knowledge on the concepts of magnetostatics, magnetic flux density, scalar and vector potential and its applications
ETC 303.4	To impart knowledge on the concepts of Faraday's law, induced emf and Maxwell's equations in free space and time varying fields.
ETC 303.5	To impart knowledge on the concepts of Concepts of electromagnetic waves and Transmission lines.
ETC 303.6	To impart the knowledge of the concept of polarization, Reflection of waves as normal incidence.

<b>Subject</b>	<b>Microcontrollers</b>
<b>Subject Code</b>	ETC 309 (304184)
<b>Course Outcome (COs)</b>	
ETC 309.1	Understand the concepts of 8051 microcontroller and its basic programming
ETC 309.2	Demonstrate the input output port interfacing of 8051 microcontroller
ETC 309.3	Demonstrate the parallel port interfacing of 8051 microcontroller
ETC 309.4	Understand the concepts of PIC microcontroller and its basic programming
ETC 309.5	Demonstrate the input output port interfacing of PIC microcontroller
ETC 309.6	Understand the basics of serial communication protocols and interfacing to real world using PIC microcontroller

<b>Subject</b>	<b>Mechatronics</b>
<b>Subject Code</b>	ETC 304 (304185)
<b>Course Outcome (COs)</b>	
ETC 304.1	Understand the Basic of mechatronics system.
ETC 304.2	Understand the Basic of sensor, transducer and their characteristic specification.
ETC 304.3	Able to understand the Hydraulic systems used mechatronics system
ETC 304.4	Able to understand the Pneumatic systems used mechatronics system
ETC 304.5	Study of electrical actuators and electromechanical actuators.
ETC 304.6	Able to prepare case study of the system given.

<b>Subject</b>	<b>Electronic System Design (ESD)</b>
<b>Subject Code</b>	ETC 306 (304193)
<b>Course Outcome (COs)</b>	
ETC 306.1	Apply the fundamental concepts and working principles of electronics devices to design electronics systems
ETC 306.2	Shall be able to interpret datasheets and thus select appropriate components and devices
ETC 306.3	Select appropriate transducer and signal conditioning circuit to design prototype of Data Acquisition system
ETC 306.4	Design an electronic system/sub-system and validate its performance by simulating the same
ETC 306.5	Shall be able to use an EDA tool for circuit schematic and simulation
ETC 306.6	Create, manage the database and query handling using suitable tools

## Semester-II

<b>Subject</b>	<b>Power Electronics</b>
<b>Subject Code</b>	ETC 307(304186)
<b>Course Outcome (COs)</b>	
ETC 307.1	An understanding of the behavior of semiconductor power devices operated as switches & their Applications in different power converters
ETC 307.2	Understand, perform & analyze of ac to dc rectifier circuits
ETC 307.3	Understand, perform & analyze of dc to ac inverter circuits

ETC 307.4	Understand, perform & analyze of dc to dc converter & ac voltage controller circuits
ETC 307.5	Design & implement over voltage / over current protection circuit.
ETC 307.6	An understanding of operation & applications of different electronic motors & their drive circuits

<b>Subject</b>	<b>Information Theory Coding Techniques &amp; Communication Networks</b>
<b>Subject Code</b>	<b>ETC 308 (304187 )</b>
<b>Course Outcome (COs)</b>	
<b>ETC 308.1</b>	Perform information theoretic analysis of communication system
<b>ETC 308.2</b>	Design a data compression scheme using suitable source coding technique
<b>ETC 308.3</b>	Design a channel coding scheme for a communication system
<b>ETC 308.4</b>	Understand and apply fundamental principles of data communication and networking
<b>ETC 308.5</b>	Apply flow and error control techniques in communication networks

<b>Subject</b>	<b>Business Management</b>
<b>Subject Code</b>	<b>ETC 401 ( 304188)</b>
<b>Course Outcome (COs)</b>	
ETC 401.1	To get awareness about various domains in Business Management.
ETC 401.2	To understand concept of Quality Management, Financial Management and Project Management.
ETC 401.3	To learn Human Resource Management, marketing management are the major tasks in Business
ETC 401.4	To promote Entrepreneurship.

<b>Subject</b>	<b>Advanced Processor</b>
<b>Subject Code</b>	<b>ETC 310 (304189)</b>
<b>Course Outcome (COs)</b>	
ETC 310.1	Describe the ARM microprocessor architectures and its feature.
ETC 310.2	To impart the knowledge of ARM processor basics in details.
ETC 310.3	To impart the knowledge of ARM processor to interface the peripheral devices.

ETC 310.4	Interface the advanced peripherals to ARM based microcontroller
ETC 310.5	Understand the architecture and features of DSP processor.
ETC 310.6	Use of DSP Processors and resources for signal processing applications.

<b>Subject</b>	<b>System Programming And Operating System</b>
<b>Subject Code</b>	ETC 311 (304190)
<b>Course Outcome (COs)</b>	
ETC 311.1	Demonstrate the knowledge of Systems Programming.
ETC 311.2	Demonstrate the knowledge of Compilers, Linkers, Loaders and different software tools.
ETC 311.3	Compare and analyze the different implementation approach of operating system abstractions.
ETC 311.4	Demonstrate knowledge of Operating System Concepts related to Concurrency Control.
ETC 311.5	Demonstrate knowledge of Memory Management Techniques.
ETC 311.6	Interpret various OS functions used in Linux.

<b>Subject</b>	<b>Employability Skills and Mini Project</b>
<b>Subject Code</b>	ETC 207 (304196 )
<b>Course Outcome (COs)</b>	
ETC 207.1	Understand, plan and execute a Mini Project with team.
ETC 207.2	Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc
ETC 207.3	Prepare a technical report based on the Mini project
ETC 207.4	Deliver technical seminar based on the Mini Project work carried out.

**Course Outcomes: Students should be able to**

**Final Year Electronics & Telecommunication Engineering (BE) (Curriculum 2012 Pattern)**

**Semester-I**

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<b>Subject</b>	<b>VLSI Design &amp; Technology</b>
<b>Subject Code</b>	ETC401 (404181)
<b>Course Outcome (COs)</b>	
ETC401.1	Model digital circuit with HDL, simulate, synthesis and prototype in PLDs.
ETC401.2	Understand chip level issues and need of testability.
ETC401.3	Design analog & digital CMOS circuits for specified applications.

<b>Subject</b>	<b>Computer Networks</b>
<b>Subject Code</b>	ETC402 (404182)
<b>Course Outcome (COs)</b>	
ETC 402.1	To understand basic concepts of the OSI reference model and the TCP-IP reference model & physical layer
ETC 402.2	To have a basic knowledge of DLL services & protocols
ETC 402.3	To understand basic concepts of Wireless LANS & Virtual Circuit Networks
ETC 402.4	To have a basic knowledge of the Network Layer Services and protocols
ETC 402.5	To have a basic knowledge of Transport layer protocols and services
ETC 402.6	To understand basic concepts of Application Layer

<b>Subject</b>	<b>Microwave Engineering (MWE)</b>
<b>Subject Code</b>	ETC 403(404183)
<b>Course Outcome (COs)</b>	
ETC403.1	To Understand formulate the wave equation in wave guide for analysis?
ETC403.2	identify the use of microwave components and devices in microwave applications?
ETC403.3	Carry out the microwave network analysis?
ETC403.4	understand the working principles of all the microwave tubes?
ETC403.5	understand the working principles of all the solid state devices?
ETC403.6	understand a suitable microwave measurement instruments and carry out th required measurements

<b>Subject</b>	<b>Elective-I Embedded Systems &amp; RTOS</b>
<b>Subject Code</b>	<b>ETC404A ( 404184 )</b>
<b>Course Outcome (COs)</b>	
<b>ETC 404A.1</b>	technology
<b>ETC 404A.2</b>	Understand Real time systems concepts
<b>ETC 404A.3</b>	Understand Linux operating system and device drivers
<b>ETC 404A.4</b>	Understanding concept of $\mu$ COS II
<b>ETC 404A.5</b>	Understanding Linux Kernel Construction
<b>ETC 404A.6</b>	Get to know the hardware – software co design issues and testing methodology for Embedded system
<b>Subject</b>	<b>Electronic Product Design</b>
<b>Subject Code</b>	<b>ETC 405C (404185)</b>
<b>Course Outcome (COs)</b>	
<b>ETC 405C.1</b>	To understand the stages of product (hardware/ software) design and development.
<b>ETC 405C.2</b>	To learn the different considerations of analog, digital and mixed circuit design.
<b>ETC 405C.3</b>	To be acquainted with methods of PCB design and different tools used for PCB Design.
<b>ETC 405C.4</b>	To understand the importance of testing in product design cycle. `
<b>ETC 405C.5</b>	To understand the processes and importance of documentation.

<b>Semester-II</b>
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<b>Subject</b>	<b>Mobile Communication</b>
<b>Subject Code</b>	<b>ETC407 (404189)</b>
<b>Course Outcome (COs)</b>	
<b>ETC 407.1</b>	To Study the Telecommunication Switching & Traffic
<b>ETC407.2</b>	To understand the Switching Networksand Signaling
<b>ETC407.3</b>	To understand the Cellular Concepts



ETC407.4	To study the First and Second Generation Mobile Systems
ETC407.5	To understand the GSM Services
ETC407.6	To study the CDMA Based Mobile Systems

<b>Subject</b>	<b>Broadband Communication System (BCS)</b>
<b>Subject Code</b>	408(404190)
<b>Course Outcome (COs)</b>	
ETC408.1	Understand light wave System Components
ETC408.2	Carry out Link power budget and Rise Time Budget by proper selection of components
ETC408.3	Understand Multichannel Systems
ETC408.4	Understand the basics of orbital mechanics and Launchers
ETC408.5	Understand the satellite subsystems and satellite antennas
ETC408.6	Carry out Satellite Link design for Up Link and Down Link

<b>Subject</b>	<b>Elective-I Audio Video Engineering</b>
<b>Subject Code</b>	402050(404191)
<b>Course Outcome (COs)</b>	
ETC 410B.1	To study the analysis and synthesis of TV Pictures, Composite Video Signal, Receiver, Picture Tubes and Television Camera Tubes
ETC 410B.2	To study the various Colour Television systems with a greater emphasis on television standards
ETC 410B.3	To study the advanced topics in Digital Television and High Definition Television
ETC 410B.4	To study the IPTV systems, Mobile TV, Video transmission in 3G mobile System
ETC 410B.5	To study the audio recording systems such CD/DVD recording, Audio Standards, and Acoustics principles
ETC 410B.6	To study the P.A. system for auditorium, Cordless microphone system, special types of speakers & microphones

<b>Subject</b>	<b>Elective-II Wireless Network</b>
<b>Subject Code</b>	ETC 411 (404192)

<b>Course Outcome (COs)</b>	
ETC 411.1	Define & explain Basic concepts of Wireless networks.
ETC411.2	Understand the concept of Wi-Fi Technology and Next Generation WLAN
ETC411.3	Understand Third Generation Mobile Services.
ETC411.4	Understand the concept of long term evolution (LTE) & its architectural detail
ETC411.5	Understand the architectures WiMAX , WiMAX Spectrum, Modulation, Channel Structure.
ETC411.6	Understand the transmission of voice and data through various networks

**Course Outcomes: Students should be able to  
(ME) ME Electronics And Telecommunication (Curriculum 2015 Pattern)**

**Semester-I**

<b>Subject</b>	<b>Digital CMOS Design</b>
<b>Subject Code</b>	<b>METC 101 (504201 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To Understand the fundamentals of CMOS Technology in Digital Domain
METC 101.2	To Explore the skills of designing digital VLSI
METC 101.3	To Demonstrate the ability of using EDA tools in IC Design

<b>Subject</b>	<b>Reconfigurable Computing</b>
<b>Subject Code</b>	<b>METC 101 (504202 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To Understand the concept of reconfigurable computing and its integration on computing platforms
METC 101.2	To Design, implement and analyze reconfigurable systems in the recent application domains using HDL
METC 101.3	To Use advanced EDA tools to simulate and synthesize HDL codes for reconfigurable architectures

<b>Subject</b>	<b>Embedded System Design</b>
<b>Subject Code</b>	<b>METC 101 (504203 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To Design ARM Processor based Embedded Systems
METC 101.2	To Carry out programming in Embedded programming in C, C++

METC 101.3	To Port Linux operating system and device drivers
METC 101.4	To Understand attributes of functional units of Network Protocol

<b>Subject</b>	<b>Research Methodology</b>
<b>Subject Code</b>	<b>METC 101 (504204 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To Outline research problem, its scope, objectives and errors
METC 101.2	To Understand basic instrumentation schemes and its data collection methods
METC 101.3	To Learn various statistical techniques
METC 101.4	To Develop model and can predict the performance of experimental system
METC 101.5	To Write research proposals of their own domain

<b>Subject</b>	<b>Wireless Sensor Network (Elective I)</b>
<b>Subject Code</b>	<b>METC 101 (504205 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To Gain knowledge of Architecture of WSN network
METC 101.2	To Understand Physical, Data link and Network layer aspects with their protocols
METC 101.3	To Learn different techniques of power management and security
METC 101.4	To Exhibit the knowledge of operating systems in WSN systems

## Semester-II

<b>Subject</b>	<b>Analog CMOS Design</b>
<b>Subject Code</b>	<b>METC 101 (504207 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To Understand design concepts and issues of CMOS amplifiers
METC 101.2	To Learn different Compensation techniques
METC 101.3	To Acquire the knowledge of designing of HF and Low Noise Amplifiers

<b>Subject</b>	<b>System on Chip</b>
<b>Subject Code</b>	<b>METC 101 (504208 )</b>

<b>Course Outcome (COs)</b>	
METC 101.1	To Learn Design flow graphs and flow modeling
METC 101.2	To Understand SoC modeling and interfacing
METC 101.3	To Gain knowledge of SoC memory system design, embedded software and energy management techniques for SoC design, SoC prototyping, verification, testing and physical design
METC 101.4	To Design , implement and test SoC

<b>Subject</b>	<b>Embedded Automotive Systems</b>
<b>Subject Code</b>	<b>METC 101 (504209 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To Understand the fundamentals of different Automotive Systems
METC 101.2	To Learn utility of sensors and instrumentation in vehicle systems
METC 101.3	To Design control system for various vehicular modules
METC 101.4	To Acquire knowledge of various automotive protocols
METC 101.5	To Provide technical embedded solutions for the development of automotive Systems

<b>Subject</b>	<b>Real Time Operating Systems (Elective II)</b>
<b>Subject Code</b>	<b>METC 101 (504210 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To List Embedded Software Developments Tools
METC 101.2	To Learn Software Development Process Life Cycle
METC 101.3	To Gain knowledge of Real Time Operating Systems with respect to uCOS
METC 101.4	To Understand RT Linux operating System

### Semester-III

<b>Subject</b>	<b>Fault Tolerant Systems</b>
<b>Subject Code</b>	<b>METC 101 (604201 )</b>
<b>Course Outcome (COs)</b>	
METC 101.1	To The student will learn functional modeling.
METC 101.2	To The student will use theory of logical fault models for testing single stuck fault.

METC 101.3	To The student will show skills for fault simulation for statistical fault analysis.
METC 101.4	To The student will exhibit the knowledge of self-checking for design of self-checking combinational circuits.
METC 101.5	To The student will exhibit the self-testing for memory, processor and PLA.

<b>Subject</b>	<b>ASIC Design</b>
<b>Subject Code</b>	<b>METC 101 (604202 )</b>
<b><i>Course Outcome (COs)</i></b>	
METC 101.1	To The student will understand the skills of designing analog and digital ASICs.
METC 101.2	To The student will use the basics of the PLDs for designing IP Cores.
METC 101.3	To The student will understand the ASIC testing.











