SE E & TC SEMESTER-I

Name Of Subject:	**Electronic Circuits**
Course Objectives: To Understand	
1	Semiconductor device MOSFET, its characteristics, parameters & applications.
2	Concepts of feedbacks in amplifiers & oscillators.
3	Operational amplifier, concept, parameters & applications.
4	ADC, DAC as an interface between analog & digital domains.
5	Voltage to current and current to voltage converters.
6	Concepts, characteristics & applications of PLL.
Course Outcomes:	
CO1	Learn the physics, characteristics and parameters of MOSFET towards its application as amplifier.
CO2	Design MOSFET amplifiers, with and without feedback, & MOSFET oscillators, for given Specifications.
CO3	Analyze and assess the performance of linear and switching regulators, with their variants, towards applications in regulated power supplies
CO4	Explain internal schematic of Op-Amp and define its performance parameters.
CO5	Design, Build and test Op-amp based analog signal processing and conditioning circuits towards various real time applications.
CO6	Understand and compare the principles of various data conversion techniques and PLL with their applications
Name Of Subject:	**Elecrtical circuits**
Course Objectives:	
1	To analyze simple DC and AC circuits with circuit simplification techniques.
2	To formulate and analyze driven and source free RL and RC circuits.
3	To formulate & determine network parameters for given network.
4	To understand the constructional details, characteristics, features and application areas of various types of electric motors.
Course Outcomes:	
CO1	Analyze the simple DC and AC circuit with circuit simplification techniques.
CO2	Formulate and analyze driven and source free RL and RC circuits.
CO3	Formulate & determine network parameters.
CO4	Explain construction, working and applications of DC Machines / Single Phase & Three Phase AC Motors.
CO5	Explain construction, working and applications of special purpose motors & understand motors used in electrical vehicles.
CO6	Analyze and select a suitable motor for difrent application.
Name Of Subject:	**Data Structure**
Course Objectives:	
1	To learn different sorting and searching algorithms and their analysis.
2	To learn linear data structures: Stack and Queue, Linked List and their applications.
3	To learn nonlinear data structures: Tree, Graph and their applications.
4	To study the systematic ways of solving problem, various methods of organizing large amount of data.
5	To solve problems using data structures such as binary tree, binary search tree, and graph and writing programs.
Course Outcomes:	
CO1	Solve mathematical problems using C programming language.
CO2	Implement sorting and searching algorithms and calculate their complexity.
CO3	Develop applications of stack and queue using array.
CO4	Demonstrate applicability of Linked List.
CO5	Demonstrate applicability of nonlinear data structures - Binary Tree with respect to its time complexity.
CO6	Apply the knowledge of graph for solving the problems of spanning tree and shortest path algorithm.
Name Of Subject:	**Engineering Mathematics - III**
Course Objectives:	
1	To make the students familiarize with concepts and techniques in Ordinary differential equations.
2	Fourier Transform, Z-Transform, Numerical methods, Vector calculus and functions of a Complex variable.
3	The aim is to equip them with the techniques to understand advanced level mathematics and its
4	applications that would enhance analytical thinking power, useful in their disciplines.

Course Outcomes:	
CO1	Solve higher order linear differential equation using appropriate techniques for modelling, analyzing of electrical circuits and control systems
CO2	Apply concept of Fourier transform and its applications to continuous & discrete systems, signal & image processing and communication systems.
CO3	Apply concept of Z-transform and its applications to continuous & discrete systems, signal & image processing and communication systems.
CO4	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
CO5	Perform vector differentiation & integration, analyze the vector fields and apply to electro-magnetic fields & wave theory.
CO6	Analyze Complex functions, Conformal mappings, Contour integration applicable to electrostatics, digital filters, signal and image processing.
Name Of Subject:	**Digital Circuits**
Course Objectives:	
1	The fundamental principles of two-valued logic and various devices used to implement logical operations on variables.
2	Boolean algebra, Karnaugh maps and its application to the design and characterization of digital circuits.
3	To analyze logic processes and implement logical operations using combinational logic circuits.
4	The principles of logic design and use of simple memory devices, flip-flops, and sequential circuits.
5	Concepts of sequential circuits and to analyze sequential systems in terms of state machines. System design approach using programmable logic devices.
Course Outcomes:	
CO1	Identify and prevent various hazards and timing problems in a digital design
CO2	Use the basic logic gates and various reduction techniques of digital logic circuit.
CO3	Analyze, design and implement combinational logic circuits.
CO4	Analyze, design and implement sequential circuits
CO5	Differentiate between Mealy and Moore machines.
CO6	Analyze digital system design using PLD.

SE E & TC SEMESTER-II

Name Of Subject:	**Control System**
Course Objectives:	
1	To introduce the elements of control system and their modelling using various Techniques.
2	To introduce methods for analyzing the time response, the frequency response and the stability of systems.
3	To introduce the concept of root locus, Bode plots, Nyquist plots.
4	To introduce the state variable analysis method.
5	To introduce concepts of PID controllers and digital and control systems.
6	To introduce concepts programmable logic controller.
Course Outcomes:	
CO1	Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.
CO2	Determine the (absolute) stability of a closed-loop control system.
CO3	Perform time domain and frequency domain analysis of control systems required for stability analysis.
CO4	Perform time domain and frequency domain correlation analysis.
CO5	Apply root-locus, Frequency Plots technique to analyze control systems.
CO6	Express and solve system equations in state variable form.

Name Of Subject:	**Object Oriented Programming**
Course Objectives:	
1	Make the students familiar with basic concepts and techniques of object oriented programming in C++ & Java

2	Develop an ability to write programs in C++ and Java for problem solving
3	Comparison of Java with other programming languages
4	Express Class Fundamentals, Declaring Objects, Assigning Object reference variables
5	ApplyInheritance basics, Using Super, Creating Multilevel hierarchy, Constructors in derived class
6	multithreading: Introduction, Creating thread and extending thread class
Course Outcomes:	
CO1	Describe the principles of object oriented programming
CO2	Apply the concepts of data encapsulation, inheritance in C++.
CO3	Understand basic program constructs in Java
CO4	Apply the concepts of classes, methods and inheritance to write programs Java
CO5	Use arrays, vectors and strings concepts and interfaces to write programs in Java.
CO6	Describe and use the concepts in Java to develop user friendly program

Name Of Subject:	**Principles of Communication Systems**
Course Objectives:	
1	To equip/ familiarize students with basic mathematical tools for time and frequency domain analysis of communication signal and systems.
2	To acquaint the students with the fundamental principles of modulation process and different amplitude and angle modulation systems.
3	To introduce the students with the concept of Sampling theorem and pulse modulation techniques PAM, PWM, PPM.
4	To impart pre-requisites of digital communication systems and explore digital representation techniques like PCM, DPCM, DM and ADM.

5	To highlight the issues in baseband digital transmission such as data representation, synchronization, multiplexing and ISI.
Course Outcomes:	
CO1	To compute & compare the bandwidth and transmission power requirements by analyzing time and frequency domain spectra of signal required for modulation schemes under study.
CO2	Describe and analyze the techniques of generation, transmission and reception of Amplitude Modulation Systems.
CO3	Explain generation and detection of FM systems and compare with AM systems
CO4	Exhibit the importance of Sampling Theorem and correlate with Pulse Modulation technique (PAM, PWM, and PPM).
CO5	Characterize the quantization process and elaborate digital representation techniques (PCM, DPCM, DM and ADM).
CO6	Illustrate waveform coding, multiplexing and synchronization techniques and articulate their importance in baseband digital transmission

Name Of Subject:	**Signals & Systems**
Course Objectives:	
1	To understand the mathematical representation of continuous and discrete time signals and systems.
2	To classify signals and systems into different categories.
3	To analyze Linear Time Invariant (LTI) systems in time and transform domains.
4	To build basics for understanding of courses such as signal processing, control system and communication.
5	To develop basis of probability and random variables.
Course Outcomes:	
CO1	Identify, classify basic signals and perform operations on signals.
CO2	Identify, Classify the systems based on their properties in terms of input output relation and in terms of impulse response and will be able to determine the convolution between to signals.
CO3	Analyze and resolve the signals in frequency domain using Fourier series and Fourier Transform.

CO4	Resolve the signals in complex frequency domain using Laplace Transform, and will be able to Apply and analyze the LTI systems using Laplace Transforms.
CO5	Define and Describe the probability, random variables and random signals. Compute the probability of a given event, model, compute the CDF and PDF.

TE E & TC SEMESTER-I

Name Of Subject:	**Microcontrollers**
Course Objectives:	
1	Understand architecture and features of 8051 and PIC18FXX Microcontroller.
2	Learn interfacing of real-world peripheral devices with microcontroller.
3	Explore different features of PIC 18F Microcontroller with Architecture
4	Use concepts of timers and interrupts of PIC 18 in programming.
5	Design and develop microcontroller based embedded application.
6	Demonstrate real life applications using PIC 18.
Course Outcomes:	
CO1	Understand the fundamentals of microcontroller and programming.
CO2	Interface various electronic components with microcontrollers
CO3	Analyze the features of PIC 18F XXXX.
CO4	Describe the programming details in peripheral support.
CO5	Develop interfacing models according to applications.
CO6	Evaluate the serial communication details and interfaces.
Name Of Subject:	**Digital Communication**
Course Objectives:	
1	To familiarize students with various digital modulation techniques used in digital communication systems.
2	To equip students the students with tools required for performance analysis of digital communication systems.
3	To introduce the students with the concept of information theory & coding techniques.
Course Outcomes:	
CO1	Apply the statistical theory for describing various signals in a communication system.
CO2	Understand and explain various digital modulation techniques used in digital communication systems
CO3	Understand performance in presence of AWGN noise
CO4	Describe and analyze the digital communication system with spread spectrum modulation.
CO5	Analyze a communication system using information theoretic approach.
CO6	Use error control coding techniques to improve performance of a digital communication system.
Name Of Subject:	**Electromagnetic Field Theory**
Course Objectives:	
1	Provide the foundation and rudiments of Electromagnetic theory essential to subsequent courses of radiation, microwave and wireless communications.
2	Expose the students to basic laws of electro statics, magneto statics leading to the Maxwell Equations for static and dynamic fields.
3	Extend these laws to Uniform Plane waves, transmission line theory and some of the case studies of applications of engineering electromagnetic field theory.
4	Case studies of applications of engineering.
5	The main focus will be on the physical interpretation of all the mathematical formulations
6	Extend these concepts to real time applications in the field Electronics and Telecommunication Engineering.
Course Outcomes:	
CO1	Apply the basic electromagnetic principles and determine the fields (E & H) due to the given source.
CO2	Apply boundary conditions to the boundaries between various media to interpret behavior of the fields on either sides.
CO3	State, Identify and Apply Maxwell's equations (integral and differential forms) in both the forms (Static, time-varying or Time-harmonic field) for various sources, Calculate the time average power density using Poynting Theorem, Retarded magnetic vector potential
CO4	Formulate, Interpret and solve simple uniform plane wave (Helmholtz Equations) equations, and analyze the incident/reflected/transmitted waves at normal incidence.
CO5	Interpret and Apply the transmission line equation to transmission line problems with load impedance to determine input and output voltage/current at any point on the Transmission line, Find input/load impedance, input/load admittance, reflection coefficient, SWR, Vmax/Vmin, length of transmission line using Smith Chart.
CO6	Carry out a detailed study, interpret the relevance and applications of Electromagnetics
Name Of Subject:	**Database Management**
Course Objectives:	
1	To understand fundamental concepts of database from its design to its implementation.
2	To analyze database requirements and determine the entities involved in the system and with one another.
3	

4	To manipulate database using SQL Query to create, update and manage Database.
	Be familiar with the basic issues of transaction processing and concurrency control.
	To learn and understand Parallel Databases and its Architectures.
	To learn and understand Distributed Databases and its applications.
Course Outcomes:	
CO1	Ability to implement the underlying concepts of a database system.
CO2	Design and implement a database schema for a given problem-domain using data model.
CO3	Formulate, using SQL/DML/DDL commands, solutions to a wide range of query and update problems.
CO4	Implement transactions, concurrency control, and be able to do Database recovery.
CO5	Able to understand various Parallel Database Architectures and its applications.
CO6	Able to understand various Distributed Databases and its applications
Name Of Subject:	**Digital Signal Processing**
Course Objectives:	
1	Understand the sampling, aliasing and block schematic of digital signal processing.
2	Introduction of transforms for analysis of systems using Z transform.
3	Introduction of DFT, FFT, DCT transforms for analysis of DT signals.
4	Design and implementation of IIR digital filters.
5	Design and implementation of FIR digital filters.
6	Apply DSP algorithms/techniques.
Course Outcomes:	
CO1	Interpret and process discrete/ digital signals and represent DSP system.
CO2	Analyze the digital systems using the Z-transform techniques.
CO3	Implement efficient transform and its application to analyze DT signals.
CO4	Design and implement IIR filters.
CO5	Design and implement FIR filters.
CO6	Apply DSP techniques for speech/ biomedical/ image signal processing.

TE E & TC SEMESTER-II	
Name Of Subject:	**Power Devices & Circuits**
Course Objectives:	
1	To introduce different power devices viz. SCR, GTO, MOSFET and IGBT with construction, characteristics, repetitive and non repetitive ratings and typical triggering/driver circuits.
2	To understand working, design and performance analysis and applications of various power converter circuits such as ac to dc converters, inverter and chopper
3	To know various protection circuit requirements of power electronic devices.
Course Outcomes:	
CO1	To differentiate based on the characteristic parameters among SCR, GTO, MOSFET & IGBT and identify suitability of the power device for certain applications and understand the significance of device ratings
CO2	To design triggering / driver circuits for various power devices.
CO3	To evaluate and analyze various performance parameters of the different converters and its topologies.
CO4	To understand significance and design of various protections circuits for power devices.
CO5	To evaluate the performance of uninterruptible power supplies, switch mode power supplies and battery.
CO6	To understand case studies of power electronics in applications like electric vehicles, solar systems etc.
Name Of Subject:	**Digital Image Processing**
Course Objectives:	
1	To become familiar with digital image fundamentals.
2	To get exposed to simple image enhancement techniques in Spatial and Frequency domain.
3	To study the image segmentation and representation techniques.
4	To become familiar with image compression methods.
5	To learn concepts of degradation function and restoration techniques.
6	To understand the Object Recognition.
Course Outcomes:	
CO1	Apply knowledge of mathematics for image understanding and analysis
CO2	Implement spatial domain image operations.
CO3	Design and realize various algorithms for image segmentation.
CO4	Design and realize various algorithms for image Compression.
CO5	Apply restoration to remove noise in the image.
CO6	Describe the object recognition system.
Name Of Subject:	**Project Management**
Course Objectives:	
1	The basics of project management and its life cycle
2	• The process of project identification, selection criteria of the project and how the project planning is undertaken.
3	
4	• The organizational structure within a project and issues related to project management
5	• The techniques for effective project scheduling and resource considerations in project.
6	• The basics of effective handling the risks as well as managing finances within the project.
	• The complete product development process and requirements for entrepreneurship along with related legal issues
Course Outcomes:	
CO1	Apply the fundamental knowledge of project management for effectively handling the projects.
CO2	Identify and select the appropriate project based on feasibility study and undertake its effective planning.

CO3	Assimilate effectively within the organizational structure of project and handle project management related issues in an efficient manner.
CO4	Apply the project scheduling techniques to create a Project Schedule Plan and accordingly utilize the
CO5	resources to meet the project deadline.
CO6	Identify and assess the project risks and manage finances in line with Project Financial Management
Name Of Subject:	**Cellular Networks**
Course Objectives: To Understand	
1	Various propagation Model and Estimation techniques of wireless communication system.
2	OFDM and MIMO technologies to explain modern wireless systems.
3	Various aspects of mobile communication system.
4	Various aspects of wireless-system planning.
5	Different Generation of Mobile Networks.
6	Diversified issues that can enhance Network Performance.
Course Outcomes:	
CO1	Understand fundamentals of wireless communications.
CO2	Discuss and study OFDM and MIMO concepts.
CO3	Elaborate fundamentals mobile communication.
CO4	Describes aspects of wireless system planning.
CO5	Understand of modern and futuristic wireless networks architecture.
CO6	Summarize different issues in performance analysis.

BE E & TC SEMESTER-I	
Name Of Subject:	**Modernized IoT**
Course Objectives:	
1	To introduce the fundamentals of sensors and actuators along with the basic concepts of an IoT & IoE.
2	To give Insights into the Architecture and M2M technology for an IoT.
3	To Exposing students to the usage of Protocol Standardization for IoT with IoT Edge and
4	Gateway Network with Communication protocols.
5	To develop design skills in industrial IoT.
6	To provide IoT Solutions with sensor-based application through embedded system platform.
Course Outcomes:	
CO1	Comprehend and analyze concepts of sensors, actuators, IoT and IoE.
CO2	Interpret IoT Architecture Design Aspects.
CO3	Comprehend the operation of IoT protocols.
CO4	Describe various IoT boards, interfacing, and programming for IoT.
CO5	lustrate the technologies, Catalysts, and precursors of IIoT using suitable use cases.
CO6	Provide suitable solution for domain specific applications of IoT
Name Of Subject:	**Cloud Computing**
Course Objectives:	
1	To introduce the fundamentals of Cloud computing, its technologies, Challenges and Applications
2	To give Insights into the virtualization technologies and Architecture.
3	To know the relationship between Cloud and SOA.
4	To classify and evaluate Cloud Security Issues.
5	To apply theory to practical knowledge through case Studies
Course Outcomes:	
CO1	To introduce the fundamentals of cloud computing, it's technologies, challenges and applications
CO2	To give Insights into the virtualization technologies and Architecture.
CO3	To know relationship between cloud and SOA.
CO4	To classify and evaluate cloud security issues.
CO5	To apply theory to practical knowledge through case studies.
Name Of Subject:	**Data Mining**
Course Objectives:	
1	To understand the basic concepts of Data mining and major issues in Data Mining.
2	To be familiar with the Data warehouse architecture and its Implementation.
3	To characterize the kinds of patterns that can be discovered by classification, clustering, and association rule mining.
4	To describe and demonstrate basic data mining algorithms, methods, tools.
5	To understand and apply various classification and clustering techniques using tools.
6	To understand latest trends in Data Mining.
Course Outcomes:	
CO1	Understand the process of data mining and performance issues in data mining
CO2	Apply data preprocessing techniques to the historical data collected in data warehouse
CO3	Analyze various types of Frequent pattern analysis methods and advanced Pattern mining tech
CO4	Evaluate various data mining algorithms for developing effective data mining models
CO5	Analyze different clustering and outlier detection methods
CO6	Design data mining models in different mining application areas
Name Of Subject:	**Radiation and Microwave Techniques**

Course Objectives:	
1	To introduce fundamental theory of radiation and microwaves.
2	To understand theory of passive and active components of microwave systems.
3	To know the characteristics of various microwave solid state active devices.
4	To learn microwave measurement techniques.
Course Outcomes:	
CO1	Differentiate various performance parameters of radiating elements.
CO2	Analyze various radiating elements and arrays.
CO3	Apply the knowledge of waveguide fundamentals in design of transmission lines.
CO4	Design and set up a system consisting of various passive microwave components.
CO5	Analyze tube based and solid state active devices along with their applications.
CO6	Measure various performance parameters of microwave components.
Name Of Subject:	**VLSI Design and Technology**
Course Objectives:	
1	To explore Hardware Description Language (HDL) and respective digital design methodologies.
2	To train the students for Complementary Metal Oxide Semiconductor (CMOS) circuit designs.
3	To realize importance of testability in logic circuit design.
4	To overview an Application Specific Integrated Circuit (ASIC) issues and to understand
5	Programmable Logic Devices (PLD) architectures with advanced features.
Course Outcomes:	
CO1	write effective HDL coding for digital design.
CO2	Apply knowledge of real time issues in digital design.
CO3	Model digital circuit with HDL, simulate, synthesis and prototype in PLDs.
CO4	Design CMOS circuits for specified applications.
CO5	Analyze various issues and constraints in design of an ASIC
CO6	Apply knowledge of testability in design and build self test circuit.

BE E & TC SEMESTER-II	
Name Of Subject:	**Fiber Optic Communication**
Course Objectives:	
1	To familiarize learners with various components & equipments used in fiber optic communication systems.
2	To study the impact of choice of components on system design.
3	To introduce students to the WDM components and their role in capacity upgrade.
4	To extend the fundamentals to design and analysis of fiber optic communication links.
5	Expose students to the measurement standards, specifications and state of art developments in optical networks.
Course Outcomes:On successful completion of the course, students able to:	
CO1	Explain the working of components and measurement equipments in optical fiber networks.
CO2	Calculate the important parameters associated with optical components used in fiber optic telecommunication systems.
CO3	Compare and contrast the performance of major components in optical links.
CO4	Evaluate the performance viability of optical links using the power and rise time budget analysis.
CO5	Design digital optical link by proper selection of components and check its viability using simulation tools.
CO6	Compile technical information related to state of art components, standards, simulation tools and current technological trends by accessing the online resources to update their domain.
Name Of Subject:	**Biomedical Signal Processing**
Course Objectives:	
1	To understand the basic biomedical signals .
2	To study origins and characteristics of most commonly used biomedical signals, including ECG, EEG, Evoked potentials, and EMG.
3	To Study the signal acquisition and preprocessing of physiological signals.
4	To study the extraction of meaningful information to identify patterns and trends within the Signals.
5	To understand the Sources and characteristics of noise and artifacts in bio signals.
6	
Course Outcomes:	
CO1	Describe the origin of various biomedical signals and Interpret the meaning of various parameters associated with biomedical signals
CO2	Analyze ECG Signals with extraction of meaningful information.
CO3	Explain Processing of EEG signals for Diseases of Central Nervous System.
CO4	Analyze EMG signals for understanding Neuromuscular Diseases.
CO 5	Analyze various Biomedical Signals.
CO 6	Process the biomedical signals to remove adaptive interference and noise.
Name Of Subject:	**Digital Marketing**
Course Objectives:	
1	To understand digital marketing & process of website design.
2	To identify the keywords for a website & understand the SEO.
3	To study the various Digital Marketing Tools.
4	To learn the use of social media websites for Digital Marketing.
5	To be conversant with Linked In platform.
6	To know the recent trends in Digital Marketing.
Course Outcomes:	
CO1	Design websites using free tools like Wordpress and explore it for digital marketing.
CO2	Apply various keywords for a website & to perform SEO.
CO3	Understand the various SEM Tools and implement the Digital Marketing Tools.
CO4	Ilustrate the use of Facebook, Instagram and Youtube for Digital Marketing in real life.
CO5	Use Linked in platform for various campaigning.
CO6	Understand the importance of recent trends in digital marketing