



MANAKULA VINAYAGAR INSTITUTE OF TECHNOLOGY

Kalitheerthalkuppam, Madagadipet, Puducherry - 605 107

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SEMESTER 1	
T101	Mathematics – I
T102	Physics
T103	Chemistry
T110	Basic Civil and Mechanical Engineering
T111	Engineering Mechanics
T112	Communicative English
P104	Physics Laboratory
P105	Chemistry Laboratory
P106	Workshop Practice
SEMESTER 2	
T107	Mathematics – II
T108	Material Science
T109	Environmental Science
T104	Basic Electrical and Electronics Engineering
T105	Engineering Thermodynamics
T106	Computer Programming
P101	Computer Programming Laboratory
P102	Engineering Graphics
P103	Basic Electrical & Electronics Laboratory
P107	NSS / NCC
SEMESTER 3	
MA T31	Mathematics III
EC T32	Electrical Engineering
EC T33	Data Structures and Object Oriented Programming
EC T34	Electronic Devices and Circuits
EC T35	Circuit Theory
EC T36	Engineering Electromagnetics
EC P31	Electrical Engineering Laboratory

EC P32	Data Structures and Object Oriented Programming Laboratory
EC P33	Electronic Devices and Circuits Laboratory
SEMESTER 4	
MA T41	Mathematics IV
EC T42	Electronic Circuits and Analysis
EC T43	Signals and Systems
EC T44	Linear and Digital Control Systems
EC T45	Digital Circuits
EC T46	Electronic Communication Systems
EC P41	Electronic Circuits Design
EC P42	Digital Circuits Laboratory
EC P43	Communication Lab I
SP P44	Physical Education *
SEMESTER 5	
MAT51	Probability and Random Process
EC T52	Data Communication Networks
EC T53	Microprocessors and microcontroller
EC T54	System Design using Integrated Circuits
EC T55	Transmission Lines and waveguides
EC P51	Microprocessor and microcontroller lab
EC P52	System Design using Integrated lab
EC P53	Networks and Transmission lab
HS P54	General Proficiency – I
ECE02	Consumer Electronics
SEMESTER 6	
EC T61	Digital Communication
ECT62	Wireless Communication
EC T63	Digital Signal Processing
EC T64	Antennas and Wave Propagation
ECE06	VLSI DESIGN

EC P61	Communication Laboratory- II
EC P62	Computer Networks Laboratory
EC P63	Digital Signal Processing Lab
HS P64	General Proficiency – II
SEMESTER 7	
EC T71	Microwave and Optical Engineering
EC T72	Embedded Systems
ECE11	Digital Image Processing
ECE25	Medical Electronics
EC P71	Communication Laboratory- III
EC P72	Embedded Systems Laboratory
EC P73	Seminar
EC P74	Industrial Visit/Training
EC PW7	Project Work-I
SEMESTER 8	
ECT82	Industrial Management And Engineering
ECE20	Cellular Mobile Communication
ECE16	Satellite Communication
EC T81	Professional Ethics
ECP81	Advanced Communication Lab
EC P82	Comprehensive Viva
EC PW8	Project Work-II

FIRST SEMESTER

Course Name: C101	
MATHEMATICS - I	
C101.1	Learn the evaluation policy of Curvature, evolutes and some special functions like Gamma & Beta function.
C101.2	Apply partial derivatives to find maxima and minima.
C101.3	Able to evaluate double integrals and triple integrals, which are used to evaluate area and volume of defined and undefined shapes.
C101.4	Gain the knowledge to solve first order differential equation arising in Engineering Field.
C101.5	Gain the knowledge to solve higher order differential equation and able to form mathematical & physical interpretation of its solution.
C101.6	Acquire knowledge of Differential and Integral Calculus concepts which are very much essential to solve the problems occurring in the areas of Engineering and Technology.

Course Name: C102	
PHYSICS	
C102.1	Understand the concepts of ultrasonic production ,detection applications and acoustical properties of buildings.
C102.2	Learn the light properties like interference ,diffraction and polarization and study their parameters like resolving power ,dispersive power of optical devices.
C102.3	Understand the basic operating principles of laser, its applications, optical fiber, and its types, transmission characteristics, applications of optical fibers.
C102.4	Study the wave mechanics concepts through wave equations and applying the knowledge of barrier penetration problem in designing electronic devices like tunnel diode.
C102.5	Understand nuclear properties ,power production through reactors and gain knowledge of fusion reactors which is under research.
C102.6	Expose the students to different areas of physics which have direct relevance and applications to different Engineering disciplinesTo understand the concepts of physics and its significant contributions in the transformed modern-day society.

Course Name: C103	
CHEMISTRY	

C103.1	To Impart the students in-depth in the discipline of water technology and develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
C103.2	Fundamentals and formation of polymers with its properties and engineering applications of polymers such as conducting polymers can be understood.
C103.3	Students are able to Illustrate the practical importance of electrochemistry for solving challenges and design of batteries.
C103.4	This unit implicit the concept of corrosion and insist the students to apply their knowledge for protection of different metals from corrosion.
C103.5	Guide the students to gain the knowledge about the cooling curves, phase diagrams, alloys and their practical importance.
C103.6	Strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with their industrial/engineering applications.

Course Name: C104 BASIC CIVIL AND MECHANICAL ENGINEERING	
C104.1	Understand the building classification as per National building code.
C104.2	Get the idea about construction procedure for various components of the building.
C104.3	Students understand the principles of surveying, construction procedure for roads, bridges and dams.
C104.4	Student will be able know about the working of Internal and external combustion systems
C104.5	Student will be able know about Non-Conventional Energy Systems
C104.6	Student will be able to know about manufacturing process

Course Name: C105	
ENGINEERING MECHANICS	
C105.1	Understand the basic laws of mechanics and resolution of forces using different methods.
C105.2	Learn and apply the knowledge on analysis of forces acting on the trusses and effect of friction force on bodies.
C105.3	Learn about the centroid and moment of inertia for plane and solid figures.
C105.4	Understand the three laws of motion, principles of dynamics for particles.
C105.5	The student will be able to analyse the laws of motion for rigid bodies.
C105.6	The student will be able to analyse the effects of forces acting on the bodies in practical situation.

Course Name: C106	
COMMUNICATIVE ENGLISH	
C106.1	Learnt about the definition of communication, importance, concept. Sender, Ideation, the levels in communication, channels, oral and written way of communication, body language and non verbal communication, Accuracy, Brevity and Clarity, different barriers for Communication, techniques in making effective communication, listening importance and types of listening.
C106.2	Students learnt about the types of letters, report writing, notices and memo and also developed their skill in writing.
C106.3	Understands the comprehension, identifies the difference between Skimming and scanning, guess the meaning of the words, Identify to make notes.
C106.4	Students learnt the writing skills, how to write a paragraph in a proper manner, four modes of writing and how to make bibliographical entries.
C106.5	Students were able to develop their spoken skills by making them to involve in many activities related to it.
C106.6	The students will be developing the four important skills i.e listening, reading, writing and speaking skills for making good communication in the language.

Course Name: C107 PHYSICS LAB	
C107.1	Able to understand how to find the thickness of the specimen and also to find the radius of curvature of glass using the phenomenon of interference of light
C107.2	Able to understand the specific rotatory power of an optical active solution using the principle of polarization
C107.3	To understand about the thermal conductivity of bad conductor and rubber tube.
C107.4	Ability to understand about the optical properties like dispersive power ,Resolving power by applying the knowledge of optics
C107.5	To acquire knowledge about the magnetometer due to current coil and jolly method of determining the pressure coefficient of air at constant volume.
C107.6	Ability to understand the basic knowledge of inference ,polarization ,Magnetic materials ,thermal conductivity that correlates the theory and practical

Course Name: C108 CHEMISTRY LAB	
C108.1	Students will become well acquainted to test amount of hardness present in sample of water for their engineering needs.
C108.2	Students will be efficient in estimating acidity/alkalinity in given samples.
C108.3	Students will have knowledge about estimating amount of dissolved oxygen in water.
C108.4	Students will become well acquainted to estimate copper in brass.
C108.5	Students will have knowledge about determination of viscosity of sucrose using Ostwald's viscometer.
C108.6	To develop an understanding of basic titration setup and methodologies for determining strength, hardness and alkalinity of various unknown solutions.

Course Name: C109	
WORKSHOP LAB PRACTICE	
C109.1	Understand and comply with workshop safety regulations.
C109.2	Student will be able to make various joints in the given object with the available work material.
C109.3	Student will be able to know how much a joint will take for the assessment of time.
C109.4	Students can able to Identify the hand tools and instruments.
C109.5	Students can able to gain knowledge about various operations carried out in sheet metal.
C109.6	Students can able to gain skills about various tools used in welding to make simple joints.

SECOND SEMESTER

Course Name: C110	
MATHEMATICS - II	
C110.1	Find the Eigen values and Eigen vectors of a matrix and use Cayley-Hamilton Theorem for finding the inverse of a matrix.
C110.2	Understand the statements of Stoke's Theorem and Gauss Divergence Theorem and be aware of applications of these theorems in Engineering Field.
C110.3	Compute the Laplace Transform of a Continuous function and familiar with its basic properties, including the initial and final value theorems.
C110.4	Compute the Inverse Laplace Transform and solving integral equations and differential equation with initial conditions.
C110.5	Determine the Fourier Transform, Fourier Cosine and Sine Transform of elementary functions, properties of transforms and its applications in engineering.
C110.6	Acquire knowledge of matrix algebra technique, vector calculus, Laplace and Fourier Transform which are very much essential to solve the problems occurring in the areas of Engineering and Technology.

Course Name: C111	
MATERIAL SCIENCE	
C111.1	Understand the crystal lattice and its structure of crystal planes ,directions and to designate the miller indices of the cubic crystal .Applying the knowledge of x-ray diffraction to analyze defects in the various crystalline solids
C111.2	To learn about the effect of polarization in dielectric material and to explain the dielectric material suitable for different application.
C111.3	The outcome of third unit makes the student to understand about different magnetic materials and to apply the basic idea of magnetism and to know about the application of magnetic storage devices.
C111.4	Understand some of the basic concepts of semiconductor and to calculate the intrinsic carrier concentration. To understand about hall effect in semi conductor and its application.
C111.5	To understand about superconductors and Different types of superconductor identifying the material suitable for various engineering applications.
C111.6	Able to understand about advanced materials and convention materials applying the knowledge to synthesis and characterize the various nano materials to known their physical and chemical properties to meet out the demands for industrial application in the new era of engineering.

Course Name: C112	
ENVIRONMENTAL SCIENCE	
C112.1	Basic Knowledge to understand what constitutes the environment, Knowledge of knowing the precious resources in the environment and the role of human being in maintaining a clean environment.
C112.2	Knowledge of knowing how to maintain ecological balance and preserve biodiversity.
C112.3	Knowledge of solving and minimizing global warming and pollution control.
C112.4	Knowledge of solving and minimizing water, land, thermal and radioactive pollution control.
C112.5	Developed skills in procedures and instrumental methods applied in analytical tasks of environmental chemistry.
C112.6	The focus of this course is to introduce students to thinking about environmental issues from an interdisciplinary perspective.

Course Name: C113 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	
C113.1	Ability to solve the circuit connections, conversion techniques and to understand the basic concepts in AC circuits.
C113.2	Ability to gain the knowledge in power measurements and to solve the mesh and nodal analysis in AC and DC circuits.
C113.3	Ability to understand the operating principles of stationary, rotating machines and power plant.
C113.4	Understand the basic operation, function and applications of PN junction diode, transistor and transducer.
C113.5	Understand the basic operation and function of logic gates flip flops, registers and counters.
C113.6	Gain knowledge on various communication systems and network models.

Course Name: C114 ENGINEERING THERMODYNAMICS	
C114.1	Can understand the basics of the thermodynamic principles
C114.2	Establish the relationship of these principles to thermal system behaviors.
C114.3	Student can develop methodologies for predicting the system behavior.
C114.4	Establish the importance of laws of thermodynamics applied to energy systems.
C114.5	Ability to explain the role of refrigeration and heat pump as energy systems.
C114.6	Able to develop an intuitive understanding of underlying physical mechanism and a mastery of solving practical problems in real world.

Course Name: C115	
COMPUTER PROGRAMMING	
C115.1	Students will have a basic knowledge on the evolution of computers, components and its applications; have an awareness of internet, network structures, word processing and worksheets.
C115.2	Students will know about various problem solving techniques, basic tokens of C program and its structure, students will also know how to interact with the computer using C program.
C115.3	Students will work with various control statements, arrays, functions, storage classes and various string manipulations.
C115.4	Students will become familiar about using structures, pointers and its manipulations.
C115.5	Know about Pre-processors, command line arguments and various file operations.
C115.6	Students will know how programming can be applied in real math problems.

Course Name: C116	
COMPUTER PROGRAMMING LAB	
C116.1	Students can work with command line interface OS's, like MS-DOS.
C116.2	Students can solve most of the real time problems with C program.
C116.3	Students can interact with computer using C program, through various input and output functions.
C116.4	Students can make a use of various keywords, constants, variables, data types, operators, type conversion in C program.
C116.5	Students will have knowledge about arrays, functions, structures and pointers in C program.
C116.6	Students will have a basic knowledge about the compilation and execution of C programs, and how it works.

Course Name: C117	
ENGINEERING GRAPHICS LAB	
C117.1	Students will be able to know and understand the conventions and the methods of engineering drawing.
C117.2	Student's ability to perform basic sketching techniques will improve.
C117.3	To provide sound knowledge about projection and section of solids.
C117.4	Students will be able to draw orthographic projections and isometric projections.
C117.5	Acquired knowledge about 2D modeling through AUTO CAD software.
C117.6	Students will be able to improve their visualization skills so that they can apply these skills in developing new products.

Course Name: C118	
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB	
C118.1	Understand the tools, accessories and various types of joints which are needed for electrical wiring.
C118.2	Ability to design the various types of wiring like staircase, tube light, fan, doctors room and godown wiring and controlling of lamp from different places.
C118.3	Ability to implement the application of diode and transistor by constructing the rectifiers with and without filters and RC coupled amplifier.
C118.4	Ability to verify the Kirchhoff's law, Demorgan's theorem and implementation of digital functions using logic gates.
C118.5	Ability to measure the voltages, frequency and phase sequence in cathode ray oscilloscope.
C118.6	Gain knowledge in domestic wiring and application of electronics device in the field of electrical engineering.

Course Name: C119	
NSS	
C201.1	To create awareness in social and environmental issues.
C201.2	To participate in relief and rehabilitation work during natural calamities.
C201.3	To develop some proposals for local slum area development and waste disposal.
C201.4	To create team work among students and produce efficient results.
C201.5	The students were taught to operate scientific Instruments or Advanced softwares.
C201.6	To motivate the students to prepare the professional and scientific reports.

Course Name: C201		Year of Study : 2020-21
MATHEMATICS - III		
C201.1	Compute the Laplace Transform of a Continuous function and familiar with its basic properties, including the initial and final value theorems. Compute the Inverse Laplace Transform and solving integral equations and differential equation with initial conditions.	
C201.2	Identify complex variable function. Apply C.R equations for testing of Analyticity of the complex function. Construct conformal mappings between regions. Solve problems on bilinear transformation and find the Taylor's and Laurent's series.	
C201.3	Analyze the complex functions with reference to their analyticity, integration using Cauchy's integral theorem and Cauchy's Residue theorem.	
C201.4	Express any periodic function as Fourier series, Fourier Sine and Cosine series and finding Fourier series for numerical values of any function.	
C201.5	Determine the Fourier Transform, Fourier Cosine and Sine Transform of elementary functions, properties of transforms and its applications in engineering.	

Course Name: C202		Year of Study: 2020-21
ELECTRICAL ENGINEERING		
C202.1	Ability to understand the construction, working principle and types of Single and three phase transformer.	
C202.2	To get acquainted with the concept of construction, types, characteristics and application of DC Machines.	
C202.3	To gain the knowledge about construction, types, N-T characteristics and speed control methods of AC machines.	
C202.4	To acquire the scientific and technological understanding special machines.	
C202.5	To gain the knowledge about the utilization of electrical energy in various industrial applications.	

EC T33 - DATA STRUCTURES AND OBJECT ORIENTED PROGRAMMING

Course Name: C203		Year of Study: 2020-21
DATA STRUCTURES AND ALGORITHMS		
C203.1	To impart knowledge on the basis of creating and analyzing programs and also to know the stack process and learn how to represent them using C language.	
C203.2	Understand the Recursive process and ability to understand the basic data structures such as queue and linked list.	
C203.3	An ability to understand the basis of tree and apply problem solving techniques.	
C203.4	An ability to understand the basis searching and sorting methods and apply them into the problem solving methods.	
C203.5	An ability to understand the basis of graph and apply different problem solving techniques and the Student will be able to understand the data structures that associates keys with values by using tables, different external storage devices.	

Course Name: C204		Year of Study: 2020-2021
ELECTRONIC DEVICES AND CIRCUITS		
C204.1	Knowledge:Outline: --Outline the physics of semiconductors and describe the V-I characteristics of PN junction diode and Zener diode for practical applications.	
C204.2	Comprehension: classify:--Classify the construction, working and characteristics of different types of Bipolar Junction Transistor and Field Effect Transistors.	
C204.3	Knowledge:Recognize:--Describe the construction, working and characteristics of Silicon controlled rectifier, Uni-junction transistor, LED, LCD, Schottky Barrier	
C204.4	Comprehension: Describe:--Describe the biasing and stabilization concepts for different types of BJT, FET and MOSFET.	
C204.5	Knowledge :Outline:-- Outline the different components such as rectifiers and filters in power supply applications.	

Course Name: C205	Year of Study: 2020-21
CIRCUIT THEORY	

C205.1	DC Circuit Analysis: Sources-Transformation and manipulation, Network theorems - Superposition theorem, Thevenin 's theorem, Norton 's theorem, Reciprocity theorem, Millman 's theorem, Compensation theorem, Maximum power transfer theorem and Tellegen's theorem – Application to DC circuit analysis.
C205.2	AC Circuit Analysis: Series circuits - RC, RL and RLC circuits and Parallel circuits – RLC circuits - Sinusoidal steady state response - Mesh and Nodal analysis - Analysis of circuits using Superposition, Thevenin 's, Norton 's and Maximum power transfer theorems.
C205.3	Transient Analysis: Natural Response-Forced response - Transient response of RC, RL and RLC circuits to excitation by DC and exponential sources - Complete response of RC, RL and RLC Circuits to sinusoidal excitation-Transient analysis by Laplace Transformation Technique.
C205.4	Magnetically Coupled Circuits: Self-inductance - Mutual inductance - Dot rule - Coefficient of coupling - Analysis of multi winding coupled circuits - Series, Parallel connection of coupled inductors - Single tuned and double tuned coupled circuits.
C205.5	Network Topology: Network terminology - Graph of a network - Incidence and reduced incidence matrices – Trees –Cut sets - Fundamental cut sets - Cut set matrix – Tie sets – Link currents and Tie set schedules -Twig voltages and Cut set schedules, Duality and dual networks.

EC T36 - ENGINEERING ELECTROMAGNETICS

Course Name: C206		Year of Study: 2020-21
ENGINEERING ELECTROMAGNETICS		
C206.1	Demonstrate the force, electrostatic field intensity, flux density for a point charge and group charges in free space using vector calculus and apply Gauss law for estimating the above parameters.	
C206.2	Employ the dielectric characteristics of dipole charges and solve the Capacitance of parallel plate, Spherical and Cylindrical Capacitors with the knowledge of Laplace and Poisson boundary condition and continuity equation.	
C206.3	Apply Biot Savart law for the straight and circular conductor to examine the Magnetic Flux and field intensity. Demonstrate the effect of magnetic field intensity on the Torque of closed coil, and to find force between two conductors.	

C206.4	Compute the Self inductance of solenoid, toroid, coaxial cable, and twin conductors by employing the Faraday's law over a varying Magnetic field. Describe the electromagnetic wave behavior using Maxwells and Poynting Theorem and discuss the behavior of waves in Boundary conditions.
C206.5	Summarize the wave impedance, attenuation, phase Properties of an Electromagnetic wave in the Dielectric and conductor mediums. Recognize the Polarization and Reflection behavior of uniform plane waves in dielectric and Conducting mediums

Course Name: C207		Year of Study: 2013-14
ELECTRICAL ENGINEERING LAB		
C207.1	Ability to conduct experiments on Transformer to determine the characteristics.	
C207.2	Ability to Pre-determine the performance characteristics of transformers.	
C207.3	Ability to conduct experiments on three phase transformer and recognize different connections of three phase transformer.	
C207.4	Ability to conduct experiments on DC Machines and to determine its performance characteristics.	
C207.5	Ability to conduct experiments on AC Machines and to determine its performance characteristics.	
C207.6	Ability to conduct experiments on speed control of DC and AC Machines.	

Course Name: C208		Year of Study: 2013-14
DATA STRUCTURES AND ALGORITHMS LABORATORY		
C208.1	Understanding the concept of data abstraction and the problem of building implementations of abstract data types are emphasized with both Linear and Non linear data structures.	
C208.2	Understanding the Selection of relevant data structures and combinations of relevant data structures for the given problems in terms of memory and run time efficiency and improve the problem solving ability.	
C208.3	To create team work among students and produce efficient results.	
C208.4	The students were taught to operate scientific Instruments or Advanced softwares.	
C208.5	To motivate the students to prepare the professional and scientific reports.	
C208.6	To make the students get developed and practice the observational skills.	

Electronic Devices and Circuits Laboratory	
CO No	Descriptions
CO1	Demonstrate the V-I Characteristics of PN Junction diode, Point contact diode, Zener diode diode, photonic devices, Clipper circuits, SCR, TRIAC using diodes, input & output Characteristics of BJT, JFET, MOSFET and UJT transistor configuration.
CO2	Determination of ripple factor for of rectifiers with and without filters and Draw the Voltage regulation characteristics of shunt using IC.

MATHEMATICS IV	
C210.1	Able to solve algebraic and transcendental equations using an appropriate numerical method.
C210.2	Able to solve a linear system of equations using an appropriate numerical method.
C210.3	Be familiar with numerical interpolation and approximation of functions. Also familiar with numerical integration and differentiation.
C210.4	Be familiar with numerical solution of ordinary differential equations.
C210.5	Able to solve Laplace, wave equation and Poisson equations by using an appropriate numerical method.

EC T42 ELECTRONIC CIRCUIT ANALYSIS	
C211.1	Students can able to know the basics of Biasing & Stabilization of mathematics to analyze transistor low frequency and high frequency models.
C211.2	Students can able to apply knowledge of mathematics to analyze transistor low frequency models.
C211.3	Students can able to apply knowledge of mathematics to analyze transistor high frequency models.
C211.4	Able to design & analyze multistage amplifiers like cascade, cascade, Darlington pair, feedback amplifiers
C211.5	Students can able to study and analyze the different types of power supplies.
C211.6	Students can able to design the basic electronic circuits and different type of amplifiers.

EC T43 - SIGNALS AND SYSTEM

Sl. NO	DESCRIPTION
CO1	Employ the Fundamental characteristics, representation and operation on signals to classify the types Continuous and Discrete time signals as periodic, causal, energy, power and periodic. Also classify the linear, time invariant, causal and stable types of systems.

CO2	Show the Continuous time signals can be represented in Frequency domains with the help of Fourier series for periodic signals and by means of Fourier and Laplace transforms for Aperiodic Signals.
CO3	Illustrate the Discrete time signals representation in Frequency domain by means of Discrete time Fourier transform and Z-transform and also evaluate its inverse.
CO4	Use the Impulse response to obtain the output of a CT and DT system to obtain the output for an arbitrary input signal with help of convolutional sum and Integrals. Explain the use of State variable and State equations for Linear Time Invariant Continuous time and Discrete time systems to find the intermediate variables.
CO5	Explain the properties of DFT and discuss the computation of DFT for discrete signals using Radix 2 FFT in DIT and DIF methods and also compute IDFT using FFT algorithms.

EC T44-LINEAR AND DIGITAL CONTROL SYSTEMS

CO No	Descriptions
CO1	Express a translational and Rotational mechanical system into its equivalent Electrical system using free body diagrams and Force-voltage, force-current, Torque-voltage and Torque-Current analogies. Solve for the transfer function for a given block diagram using block diagram reduction techniques and Mason's Gain formula.
CO2	Determine the output response and time domain specifications of first and second order closed loop systems through Laplace transform method and Apply the Positional, Integral and derivative controllers for reducing the steady state errors and transient response of first and second order control systems.
CO3	Synthesize the frequency response from the transfer function using Bode plot and Polar plot and analyse the stability of the given system.
CO4	: Diagnose the stability of a given system from its transfer function with the help of Ruth-Hurwitz criteria and Root locus Techniques.
CO5	Illustrate the application of z Transforms for digital control systems with the help of Pulse Transfer function and check the stability of the system using Jury's Stability test. Discuss the evaluation of state space variables through State space modeling for digital control system using Jordan Canonical form and diagonal canonical form.

ECT45 - DIGITAL CIRCUITS

EC T45 DIGITAL CIRCUITS

C214.1	Comprehension: Explain: --Explain the binary, octal, decimal & hexadecimal number system and discuss about the code conversion & methods for detecting and correcting errors in Binary codes.
C214.2	Application: Solve: -- State the Basic theorems of Boolean algebra and solve the logic Function with the help of Karnaugh map and Quine-McCluskey methods for simplification and NAND gate and NOR gate realization
C214.3	Synthesis: Design: --Design the Combinational Logic circuits Adder, Comparator, Encoders, Decoders and Multiplexers with help of logic gates and explaining the concepts of Programmable Logic devices
C214.4	Comprehension: Design: --Describe the concept of Sequential Circuits, CPLD and Field programmable Gate Array and Design the counters and Registers
C214.5	Comprehension: Discuss: --Discuss about classification of Memories and working principles with the knowledge of basic logic circuits

EC T46- ELECTRONIC COMMUNICATION SYSTEMS

CO No	Descriptions
CO1 K2	Comprehension: Discuss:--Discuss the Functional blocks of AM transmission and reception methods using SSB, VSB generation and De-modulation with Diode, Synchronous detection through Power relations and Frequency spectrum. Describe the choice of IF, LO, Tracking, Alignment, AVC, AFC in Communication receivers by AM characteristics.
CO2 K3	Application: Discover:--Discover the Functional blocks of FM transmission and reception methods using Direct and Indirect methods of Generations with De-modulation schemes using Slope detectors, Phase discriminators, Ratio detectors.
CO3 K2	Comprehension: Explain:--Explain the Noise performance of linear modulation system for SSB-SC, DSB-SC, AM and FM systems by classifying external and internal noises and defining Noise figure, noise temperature and AWGN. Defend the Pre-emphasis and De-emphasis effects in FM and Threshold effect in FM for audio frequencies.
CO4 K1	Knowledge: Identify:--Identify the principles of Pulsed radar, MTI radar, CW Doppler Radar, FM CW Radar, Phased array radars, Planar array radar employing principles of radar antennas, scanning & display methods, radar beacons and Radar range Equations.
CO5 K2	Comprehension: Describe:--Describe the B/W and colour-transmission and reception of Television systems through distinguished standards. Outline the working of Colour TV, Digital Television receivers, EDTV, HDTV, modern TV cameras, LCD and plasma displays.

EC P41 - ELECTRONIC CIRCUITS – I LABORATORY

CO No.	DESCRIPTION
C216.1	With the help of design principles practice different types of amplifiers CE amplifiers, Differential amplifier, common Emitter , Darlington, FET Amplifier, Cascode and cascade amplifier, feedback amplifiers

	and power amplifiers.
C216.2	With the help of design principles demonstrate low frequency and high frequency oscillators, integrator, differentiator and multivibrators.

EC P42 –DIGITAL CIRCUITS LABORATORY

DIGITAL CIRCUITS LAB	
C217.1	Comprehension:Discuss:-- Discuss the combinational circuit as Adder,Subtractor, Magnitude comparator, Multiplexers, Encoders, Decoders and Demultiplexers using basic logic gates.
C217.2	Comprehension:Discuss:-- Discuss the sequential circuits Shift register, Ripple Counters, Synchronous Counterswith the help of digital basic logic gate.
C217.3	Application:Practice:-- Practice to simulate the performance of Ex-OR Gate, Full Adder, Multiplexer, Binary Up-Counter, and Binary Up-down Counter & Shift Register using Verilog HDL Language.

EC P43 - COMMUNICATION LABORATORY-I

EC P43 COMMUNICATION LAB I	
C218.1	Demonstrate the modulation and demodulation schemes for AM, FM, PAM, PWM, PPM, Ring modulator and TDM circuits by tracing the input and output
C218.2	Illustrate the frequency response of tuned & wideband amplifiers, frequency mixer circuits and discuss the sample-hold, simple delayed AGC circuits by tracing its impacts.
C218.3	Sketch the time and frequency domain response of AM, FM, PAM, PWM, PPM signals using MATLAB and PSPICE/EWB.

PHYSICAL EDUCATION

C219.1	Physical education majors demonstrate understanding of how individuals learn and develop and can provide opportunities that support students' physical, cognitive, social, and emotional development
C219.2	Physical education majors demonstrate an understanding of individual and group motivation and behavior by creating safe learning environments that encourage positive social interaction, active engagement in learning, and self-motivation

Course Name: C301		Year of Study: 2014-15
PROBABILITY AND RANDOM PROCESSES		
C301.1	Explain and illustrate the concept of a discrete random variable and its probability distributions.	
C301.2	Explain and illustrate the concept of a Continuous random variable and its probability distributions.	
C301.3	Understand the concept of Random processes in both deterministic and non deterministic types.	
C301.4	Familiar with Markov chains in discrete time with respect to state diagram, able to calculate transition probabilities.	
C301.5	To expose the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.	
C301.6	The students will have an exposure of various distribution functions and ability to select an appropriate distribution for analyzing data specific to an experiment. Also acquire skills in analyzing queuing models.	

EC T52 –DATA COMMUNICATION NETWORKS

Sl. NO	DESCRIPTION
C32-CO1	Discuss the LAN, PAN, MAN&WAN networks with the OSI/ISO, TCP/IP, ISDN-ATM, SONET/SDH protocol specification and applications of UWB, Bluetooth, WIFI with Cognitive radio.
C32-CO2	Explain the types of errors, flow control, error correction and detection layer with MAC protocols. Describe the IEEE standards for wired LAN and wireless LAN

C32-CO3	Define the network routing for logical addressing in IPv4 addresses, IPv6, Internet protocol, Transition from IPv4 to IPv6, mapping logical to physical address, Mapping physical to logical address, ICMP, Direct Vs indirect delivery, Forwarding. Explain the routing protocols and routing algorithms with differentiation routers and gateways.
C32-CO4	Discuss the elements of transport control such as addressing, Connection Establishment, Connection Release, Error Control and Flow Control. Discuss the elements of congestion control, RPC -TCP Protocol, TCP connection management, TCP sliding window protocols
C32-CO5	Describe the security issues in internet and Explain the Cryptography algorithm (AES and DES, RSA) with authentication protocols.

EC T53 - MICROPROCESSORS AND MICROCONTROLLERS

CO No	Descriptions
CO1	Comprehension: Describe:- Describe the architecture of 8085 and development of assembly language program by using instruction sets, stack and subroutines, looping statements and discuss about addressing modes of a typical microprocessor.
CO2	Comprehension: Describe:- Describe the function of different peripheral IC's 8255,8279,8253,8251,8259,8237 to interface with external peripheral device.
CO3	Application: Demonstrate:- Demonstrate the architecture of 8051 and also develop the assembly language program with the help of special function registers, timers and counters. Discuss the basic architecture of PIC16F877 and ARM processor.
CO4	Comprehension: Describe:- Describe the architecture of 8086 and also develop the ASM program with the help of instruction set and addressing modes. Express the features of advanced processors 80826,80486 and Pentium Processors
CO5	Comprehension: Discuss:- Discuss about the applications of Microcontroller based design employing ADC and DAC chips, push button switch, Stopwatch, DC Motors, stepper motor, Servomotors, Thermometer and Traffic light control for real time applications.

EC T54 SYSTEM DESIGN USING INTEGRATED CIRCUITS

ECT 54 SYSTEM DESIGN USING INTEGRATED CIRCUITS	
1	Impart knowledge on linear ICs in designing various circuits in the field of electronics engineering.

<u>2</u>	Acquire knowledge in linear ICs 555, PLL565 and their IC7900.
<u>3</u>	Gain knowledge in different digital integrated circuits and their families with their comparisons.
4	Design the system and demonstrate state diagram and state machines using synchronous and asynchronous sequential logic circuits.
5	Understand the design concepts of processor and control unit with processor and bus organization..

EC T55 - TRANSMISSION LINES AND WAVEGUIDES

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CO No.	Descriptions
CO1	<i>Application: Demonstrate: Understanding</i> about two port networks and how to use them. Analyze important two port networks like filters, attenuator and equalizer.
CO2	<i>Application: Employ: Understanding</i> the concept of transmission lines and the losses associated with them and to <i>Employ</i> use inductive loading to minimize the losses..
CO3	<i>Application: Understanding: Understanding</i> impedance transformation and matching Analyze the transmission lines and their parameters using the Smith Chart.
CO4	<i>Application: Analyze: Analyze and Design</i> Analyze the characteristics of EM wave propagation in Parallel plate, Rectangular waveguide.
CO5	<i>Comprehension: Analyze: Analyze</i> the characteristics of EM wave propagation in, Circular waveguide and Cavity resonators

EC E02-CONSUMER ELECTRONICS

Sl. NO	DESCRIPTION
CO1	Describe the Construction and working principle of Crystal Loudspeaker, Dynamic Loudspeaker, Electrostatic loudspeaker, Permanent Magnet Loudspeaker, Woofers and Tweeters, Crystal Microphone, Carbon Microphones, Dynamic Microphones and Wireless Microphones.
CO2	Describe the working principle of monochrome and color television standards and system with the knowledge of basic electronics.
CO3	Explain the construction, processing and recording of audio signals and video signals

	involving optical source for CD and DVD player.
CO4	Discuss the working principle of PSTN, PABX switching, ISDN, GSM, GPRS, DECT, UMTS, IMT2000, Limited range Cordless Phones and Facsimile, Wifi and Bluetooth with help of functional diagram.
CO5	Discuss the Basic working principle and block diagram of microwave oven, washing machine hardware and software, components of air conditioning and refrigeration systems, Proximity Sensors and accelerometer sensors in home appliances.

SL.NO	COURSE OUTCOMES
CO1	Demonstrate the programming of 8085 microprocessor using various addressing modes and instruction sets for data movement, arithmetic and logical operation.
CO2	Illustrate the interfacing of LCD, ADC/DAC, stepper motor, Traffic Light and serial communication by programming 8051 microcontroller.
CO3	Use the Keil software tool for simulating the interfacing of Relay switches, Pulse width Modulation, LCD and LED.

EC P52 - SYSTEM DESIGN USING INTEGRATED CIRCUITS LABORATORY

EC P52 SYSTEM DESIGN USING INTEGRATED CIRCUITS LABORATORY	
<u>1</u>	Discuss the performance of the Operational amplifier as inverting-non inverting amplifier, voltage follower, summer & subtractor, differentiator & integrator, comparator, signal convertor, active filters, log-antilog & instrumentation amplifier and multivibrator, precision rectifier using IC 741.
<u>2</u>	Determine the performance of data convertors, frequency synthesizers and multivibrator circuits by using R-2R ladder and successive approximation types, PLL IC565 and IC 555.

ECT 53 - NETWORKS AND TRANSMISSION LINES LABORATORY

CO No.	DESCRIPTION
C309-1	Experiment different types of filters, equalizer, attenuators and LC

	resonant circuit with help of network design Principle.
C309-2	Identify the Impedance (Z) and ABCD Parameters of a Two port transmission line
C309-3	Practice the simulation of magnitude response for Low pass, High pass, Bandpass and Bandstop filter using MATLAB tool.

EC T61- DIGITAL COMMUNICATION

CO No.	Descriptions
CO1	Comprehension: Explain:--CO1: Explain the transmission and reception of the basic types of Base Band modulation schemes- PCM, DPCM, DM & ADM systems and discuss about the multilevel transmitters, companding techniques, correlation receiver and the matched filters used in the detection of Baseband signals.
CO2	Comprehension: Discuss:--CO2: Discuss about the principles of passband transmission schemes- ASK, FSK, PSK, QPSK, DQPSK, MSK, QAM with error performance for the coherent and non coherent detection of binary and M-Ary signaling.
CO3	Application: Demonstrate:--CO3: Demonstrate the CDMA processes using the spread spectrum communication techniques and spread spectrum types - DSSS, FHSS & Hybrid systems with RAKE receiver in demodulator section for multiple access communication.
CO4	Comprehension: Describe:-- CO4: Describe the Symbol and frame synchronization and Network synchronization in receivers, open and closed loop synchronization in the transmitters and Tracking and acquisition in the spread spectrum system used in digital communication.
CO5	Comprehension: Compute:-- CO5: Compute the classical encryption, Cipher principles, Data encryption, Stream encryption, Key management, Diffie-Hellman key exchange, Elliptic curve architecture and cryptography, Public key encryption system, RSA algorithm encryption and decryption processes used in digital communication.

. EC T62 WIRELESS COMMUNICATION

CO No.	Descriptions
C312-CO1	Comprehension(K2): Explain:--Explain the principle of cellular network and multiple access schemes for environment with multipath fading, spectrum limitations and Interference limited systems also give the requirements and types of services
C312-CO2	Comprehension: Discuss:-- Discuss the propagation mechanisms in wireless using propagation models in a multipath environment for small scale fading types
C312-CO3	Comprehension: Explain:--Explain the signal reception tech using diversity, signal combining Techniques and equalization and Explain the effect of channel coding and speech coding in

	reception
C312-CO4	Comprehension: Discuss:-- Discuss the multiple access systems using SS, CDMA, OFDMA employed over GSM, IS95 and 3G
C312-CO5	Comprehension: Explain:--Explain the mobile data services for low speed and high speed internet and IP based wireless Networks like 3GPP, 3GPP2.

EC T63-DIGITAL SIGNAL PROCESSING

Sl. NO	DESCRIPTION
CO1	Design of IIR digital filters using analog Butterworth and Chebyshev approximation and Impulse invariance and bilinear transformation methods for the given specification and Realize in Direct form I, II, cascade, parallel and adder realization.
CO2	Design of N tap FIR filters using frequency sampling techniques and windowing technique from the given desired frequency response. Realize the given FIR filter using Transversal, linear phase and polyphase realization structures.
CO3	Estimate the Quantization noise for input quantization error, coefficient quantization error and product quantization error and find the Overflow limit cycle oscillation with Scaling to prevent overflow and Limit cycle oscillations from the basic number representation techniques.
CO4	Summarize the parametric and non parametric Power spectral Estimation Techniques for random signals and the application of multirate conversion using decimation and Interpolation over subband coding of speech.
CO5	Explain the VLIW architecture of TMS DSP processors with reference to addressing modes and on chip peripherals.

EC T64 - ANTENNAS AND WAVE PROPAGATION

CO No.	Descriptions
CO1	Comprehension(K2): Discuss: -- Define the fundamental characteristics of the antenna. Discuss the radiation characteristics and near/far field current distribution of a current element, monopole, halfwave dipole. Describe the electromagnetic radiation from the broadside, end-fire, and binomial array antennas considering two-point sources
CO2	Knowledge: Outline:-- Outline the radiation mechanism of uniform and tapered rectangular

	aperture along with the concept of aperture blockage. Define the Babinet's principle for aperture antennas. Explain the structure, radiation mechanism, and applications of horn antenna, reflector antenna, slot antenna, and microstrip antennas
CO3	Comprehension: Discuss:-- Explain the construction, design parameters, radiation mechanism, and applications of Travelling wave wire, V and Rhombic antenna, folded dipole, Yagi-Uda antenna, Log-periodic antenna, Biconical antenna, Spiral antenna, Helical antenna, Loop antenna.
CO4	Knowledge: Recognize:-- Recognize the construction, radiation mechanism, and applications of special antennas like Electromagnetic compatibility antenna, Reconfigurable antenna, Active antenna, Dielectric antennas, Patch antenna, Smart antenna. Identify the gain, radiation pattern, polarization, and VSWR of the antenna using different antenna measurement techniques.
CO5	Knowledge: Define: --List the factors involved in radio wave propagation. outline the concept of ground wave propagation along with the reflection of radio waves by the earth's surface. Define the space wave propagation along with the considerations and atmospheric effects. Recognize the ionospheric propagation, its radiation mechanism.

EC E06-VLSI DESIGN

Sl. NO	DESCRIPTION
CO1	Describe the IC Manufacturing Process and VLSI Fabrication (NMOS,PMOS,CMOS and BICMOS).Discuss about the Static and Dynamic power Dissipation and Reduction techniques, pull up to pull down ratio and propagation delay for mos transistor.Demonstrate the stick diagram and Layout diagram NMOS and CMOS Inverter with the help of design rules and choice of layers.
CO2	Demonstrate the Inverter,NAND ,NOR gates by using Pass Transistor,Transmissiongate,NMOS ,CMOS and BICMOS.Sketch the Parity generator, Multiplexers,Code Converters and Programmable Logic Devices with the help of nMOS PLA and pMOSPLA.Discuss about the clocked Sequential circuits,D-Latch,D-Flipflop,DRAM,SRAM and Pseudo Static RAM, inverting and noninverting registers,barrel shifters with the help of MOS Transistors.
CO3	Demonstrate the types of logic families such as Dynamic ,Domino ,Pseudo NMOS Logic.Demonstrate the types of adders and multipliers such as one bit adder Ripple carry ,Carry Look ahead ,Carry skip ,Signed parallel adder and Serial parallel multiplier ,2's complement array multiplication and booth encoding with the help of CMOS Transistors.
CO4	Discuss the methodologies for CMOS Testing such as Ad Hoc Testing ,Scan Based Test ,Boundary scan design,Built in Self Test.Describe the Test Pattern Generation,Fault Models,Test Pattern Generation and Fault Simulation with the help of CMOS Transistor.

CO5	Use the operators, datatypes Continuous assignment, Sequential and parallel statement groups, timing control, task and functions, blocking and non blocking assignments, If -Else and case statements, For, while - repeat and forever loops to demonstrate a verilog HDL Program. Use Behavioral modelling to write a verilog program for both Combinational and Sequential logic.
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EC P61 - COMMUNICATION LABORATORY- II

CO's	Descriptions
CO1	Describe the baseband and passband modulation and demodulation techniques for the transmission of signals implemented through wired channels
CO2	Demonstrate the functionality of DS-CDMA and frequency synthesizer circuits to understand spread spectrum communication
CO3	Interpret the BER and encryption performance of a digital communication system through MATLAB simulation.

EC P62 - COMPUTER NETWORKS LABORATORY

CO	Descriptions
CO 1	Examine: Analyze the generation of traffic models of voice, data, video and ISDN model using MATLAB & performance of various encryption, decryption, flow control algorithms,
CO 2	Examine: Analyze the error control algorithms in the network strategy, shortest routing algorithms using MATLAB. Analyze the various routing protocol/algorithms & implementation of the

EC P63—Digital signal Processing Laboratory

CO No	Descriptions
C318.1	Practice the using MATLAB the simulation of Convolution , Filter design in both IIR and FIR methods, Spectrum estimation and equalization of digital audio with the help of DSP techniques.

C318.2	Demonstrate using TI TMS DSP processor the practical implementation of waveform generation, Convolution , Filter design in both IIR and FIR methods and spectrum estimation through FFT.
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EC T71 - MICROWAVE AND OPTICAL ENGINEERING

CO No	Descriptions
CO1	Knowledge: Outline:- Outline the working principle of Gunn, IMPATT, TRIPATT, Microwave BJT and MESFET semiconductor devices with the knowledge of semiconductor physics. outline the microwave generation and amplification methods through two cavity, reflex klystron oscillator, helix travelling wave tube, cylindrical magnetron devices.
CO2	Comprehension: Summarize:- Summarize the characteristics and applications of microwave passive components using S – parameters calculation.
CO3	Comprehension: Discuss:- Describe the various elements of fiber optic system and the characteristics light in the optical fiber cable. Discuss the various attenuation mechanisms like absorption, scattering and bending losses, Material and waveguide dispersion, Signal distortion in SM fibers, Polarization Mode dispersion.
CO4	Comprehension: Describe:- Describe the characteristics and operations of the optical sources like LED and LASER, Optical detectors like PIN and APD. Summarize the operation and applications. Erbium Doped Fiber Amplifiers-principle.
CO5	Comprehension: Generalized:- Generalize the first and second generation optical network architectures namely SONET/SDH, WDM, wavelength routed networks. Summarize the recent optical technologies like solitons, optical CDMA, PON and FTH.

EC T72 - EMBEDDED SYSTEMS

EC T72 EMBEDDED SYSTEMS	
CO 1	Get the basic knowledge to understand the system software and computer hardware of an embedded system along with its buses and devices.

CO 2	Understand and implement the logical thinking through embedded C programming.
CO 3	Apply the knowledge to design and demonstrate novel embedded system with RTOS.
CO 4	Understand the reliability and clock synchronization in hardware.
CO 5	Gain the knowledge in power consumption issues and power minimization approaches.

EC E11-Digital Image Processing

Course Name: C404		Year of Study: 2017-18
DIGITAL IMAGE PROCESSING		
C404.1	Understand the fundamental concepts in image processing	
C404.2	Derive and analyse the mathematical concepts related to image transforms	
C404.3	Learn, understand and investigate the different image enhancement techniques and image restoration techniques	
C404.4	Learn about different image compression techniques and be able to design new compression algorithms.	
C404.5	Understand the importance of different image segmentation techniques and be able to design new segmentation algorithms.	

EC E25 - MEDICAL ELECTRONICS

CO No.	Descriptions
CO1	Comprehension: Discuss the waveform, Signal characteristics of a biological signal from human body with the knowledge of Biopotential electrodes and measure them with the help of ECG, EEG, EMG and PCG Lead systems.
CO2	Knowledge: Recall: Recall working of pH, pO ₂ , pCO ₂ meter, Blood pressure, Temperature, Pulse rate of a human body and measure the parameters with the help of Electronic devices.
CO3	Comprehension: Describe: Describe the function of Cardiac pacemaker, Defibrillator, Dialyzer and Heart Lung Machine with its working operation.
CO4	Comprehension: Summarize: Summarize the functional block diagram of Microwave, Ultrasonic, Surgical diathermies, Radio pill and define the principle of single channel and multi channel bio telemetry systems with their applications.

CO5	Comprehension: Describe: Describe the purpose of Thermography, Endoscopy, Laser, Cryogenics, telemedicine in the medical field.

EC P71 – COMMUNICATION LABORATORY-III

CO	Descriptions
CO 1	Examine the V-I and characteristics of Klystron, Gunn diode in the X band and also determine the characteristics of Antenna, Dielectric, matched load, Directional coupler, Magic Tee, circulator and isolator by measuring VSWR
CO 2	Discuss the Frequency response, Attenuation, Coupling loss, bending loss, Numerical aperture and Acceptance angle of a fiber and its bit error performance by establishing end to end digital optical fiber link

EC P72 - EMBEDDED SYSTEMS LABORATORY

CO No.	Descriptions
C406.1	Examine the concept and use of potentiometer for measuring the voltage, water pump controller to sense the water level, digital clock, temperature sensor interfacing ,PC through RS232 Interface
C406.2	Apply the knowledge and implement the logical thinking of embedded C program in FM link between to microcontrollers, Obstacle detection ,Hot chamber controller, moisture sensor ,lamp controller

EC T82 –INDUSTRIAL MANAGEMENT AND ENGINEERING

Course Name: C410		Year of Study: 2016-17
INDUSTRIAL MANAGEMENT		
C410.1	Understanding factors to be considered in selection of Plant Location and material handling equipments.	
C410.2	A deep understanding of the various sources to start a business and the types of organization.	
C410.3	Introduction to inventory control, materials and production management.	
C410.4	A basic understanding of financial management systems	
C410.5	To Study the Core concepts of marketing and Human Resources Management	

EC P81-ADVANCED COMMUNICATION LABORATORY

SL.NO	COURSE OUTCOMES
C01	Analyze the performance of microwave and optical link and analyze the spectrum of various band pass signal.
C02	Understand the characteristics of various communication link in terms of error rate and spectral efficiency using MATLAB.

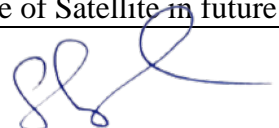
EC E20- CELLULAR MOBILE COMMUNICATION

SL. NO	DESCRIPTION
CO1	Outline the fundamentals of cellular Mobile communication concepts using frequency reuse, Interferences, Trunking and Analyze various techniques in improving coverage and system capacity.
CO2	Illustrate Mobility Management through Handoff detection, Channel assignment techniques, Network signaling and authentication. Summarize the Significance of network signaling and Services using PACS and cellular digital packet data.
CO3	Discover the enhancement of second generation cellular network through GSM mobile architecture and its services include SMS, MNP, Roaming, & VoIP with advantages and limitations.
CO4	Express the working Principle of Wireless Application Protocol using its model, Gateway, Developer Tool kits and execution environment.
CO5	Recall the Real time applications of Cellular Mobile Communication with 3G, WLL, Bluetooth technologies.

EC E16 - SATELLITE COMMUNICATION SYSTEMS

CO No	Descriptions
CO1	Comprehension: Discuss:-- Discuss the types of Satellite, orbits, orbital equation, orbital elements, look angle determination, limits of visibility, eclipse, sub satellite point, sun transit outage of a satellite system and also discuss the Structural, power, Attitude and orbit control, thermal, propulsion, TTCM, communication and antenna subsystems through the use of block diagram.
CO2	Comprehension: Explain:-- Explain terrestrial interface, Transmitter, receiver, antenna systems with the help of block diagram and Express the Uplink and Downlink equation, Link power budget & Eb/No calculation and also discuss about the Inter modulation interference, Propagation characteristics and frequency consideration, system reliability and design lifetime of a satellite.
CO3	Comprehension: Describe:-- Describe the FDMA, TDMA concept with the help of Frame and burst structure and also discuss CDMA concept using DS and FH CDMA system and also compare the FDMA, TDMA and CDMA systems.
CO4	Comprehension: Discuss:-- Discuss the Inter satellite links, Optical communication for Satellite networks, laser crosslink analysis and Optical beam acquisition, Tracking and pointing of a satellite with the help of block diagram.
CO5	Comprehension: Explain:-- Explain Packet Satellite, Fixed Satellite, Broadcast satellite, Mobile Satellite, Maritime satellite networks and services, VSAT, GPS, Gateways, ATM over satellite with the help of block diagram and also discuss the role of Satellite in future networks.




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