K.L.N.COLLEGE OF ENGINEERING, POTTAPALAYAM.

DEPARTMENT OF ECE

REGULATION 2013

B.E ECE - COURSE OUTCOMES (CO)

Course ID	Semester	Course Code	Course Name	Course Outcome
C11	I	HS6151	Technical English – I	CO[I] Illustrate method of technical communication to individuals and groups.
				CO[II] Explain different types of learning through observation and perfect reproduction.
				CO[III] Demonstrate flawless writing using wide range of Vocabulary Practices.
				CO[IV] Interpret different visual materials and forms of interviews.
				CO[V] Infer email communication and technical creative writing.
C12	I	MA6151	Mathematics - I	CO[I] Find the Eigen values & Eigen vectors of the matrices and describe the concepts of Cayley-Hamilton theorem, diagonalization of matrices and reduction of a quadratic form by orthogonal reduction.
				CO[II] Analyze the angle between two lines, equation of a plane and straights and familiar with the concept of coplanar lines, shortest distance between skew lines, sphere and planes.
				CO[III] Solve problems on curvature, radius and circle of curvatures in various types of co-ordinates and obtain evolutes and envelopes of the standard curves.
				CO[IV] Calculate the total derivative, differentiation of implicit function, Taylor series of function of two variables and determine Jacobian elements, Maxima, Minima of two Variables and Lagragian multiplier.
				CO[V] Solve the P.I. of Cauchy and Legendre equation and explain the method of variation of parameters and solve simultaneous linear equations.
C13	I	PH6151	Engineering Physics– I	CO[I] Classify the Bravais lattices and different types of crystal structures and growth techniques.
				CO[II] Demonstrate the properties of elasticity and heat transfer through objects.

				CO[III] Explain black body radiation, properties of matter waves and Schrodinger wave equations.
				CO[IV] Illustrate the acoustic requirements, production and application of ultrasonics.
				CO[V] Examine the characteristics of laser and optical fiber.
C14	I	CY6151	Engineering Chemistry-I	CO[I] Explain the methods of treatment of water for boiler and domestic use.
				CO[II] Describe the methods of preparation of industrial polymers, their characteristics and its applications.
				CO[III] Illustrate the significance of absorption in catalyst and pollution control.
				CO[IV] Differentiate the methodology of harvesting energy from nonconventional energy sources.
				CO[V] Prescribe the correct engineering materials for designing machineries, etc.
C15	I	GE6151	Computer Programming	CO[I] Demonstrate the organization of a computer and number systems.
				CO[II] Explain the attributes of algorithm and programming basics.
				CO[III] Illustrate the simple programs by using arrays and string functions.
				CO[IV] Explain the functions and pointers for solving the problems.
				CO[V] Practice the simple applications using structure and union.
C16	I	GE6152	Engineering Graphics	CO[I] Sketch the conic sections, special curves, orthographic views from pictorial views/models and outline their practical applications.
				CO[II] Apply the principles of orthographic projections of points in all quadrants, lines and planes in first quadrant.
				CO[III] Sketch the projections of simple solids like prisms, pyramids, cylinder and cone and obtain the traces of plane figures.
				CO[IV] Sketch the sectional views of solids like cube, prisms, pyramids, cylinders, cones and its lateral surfaces.
				CO[V] Apply the principles of isometric and perspective projections of simple solids, truncated prisms, pyramids, cone and cylinders.
C17	I	GE6161	Computer Practices Laboratory	CO[I] Use word processing, spread sheet and power point software tools.
				CO[II] Model and debug the C language programs.
				CO[III] Explain the simple search and sort algorithms.
				CO[IV] Review the use of pointers in C programming.
				CO[V] Analyze the arrays, functions and structures in C programming.
C18	I	GE6162	Engineering	CO[I] Use wiring circuits for residential house, fluorescent lamp and stair case.

				CO[II] Classify the electrical quantities of V, I & PF in RLC and energy with single phase energy meter.
			Practices Laboratory	CO[III] Demonstrate the logic gates and electronic components.
				CO[IV] Manipulate PCB with electronic components, devices and circuits for general purposes.
				CO[V] Perform HWR & FWR with ripple factor and clock signal generation.
C19	I	GE6163	Physics and Chemistry Laboratory - I	CO[I] Calculate the wavelength of spectral lines using spectrometer and the wavelength of laser, particle size, acceptance angle of an optical fiber using semiconductor diode laser.
				CO[II] Appraise the Young's modulus of the beam by non-uniform bending method, the velocity of sound and compressibility of the liquid using ultrasonic interferometer and thermal conductivity for bad conductors using Lee's disc apparatus.
				CO[III] Examine the DO content in water sample by winkler's method and molecular weight of polymer by Ostwald viscometer.
				CO[IV] Test the strength of an acid using pH meter and conductometer.
				CO[V] Investigate the amount of acids in a mixture by conductometer.
C21	II	HS6251	Technical English – II	CO[I] Demonstrate informal communication and participating.
				CO[II] Illustrate conversation practices and phrasal verbs in real life situations.
				CO[III] Explain the structure of conversation and writing strategies.
				CO[IV] Explain forms of interviews and profile preparation for a job.
				CO[V] Dramatize the participation skill in group discussion & project report preparation.
C22	II	MA6251	Mathematics - II	CO[I] Calculate Laplace Transforms of periodic functions and solve the ODE using Inverse Laplace Transform.
				CO[II] Discover solenoidal, irrotational vectors and explain the concepts of Green's & Gauss divergence, Stokes theorem to evaluate single, double and triple integrals.
				CO[III] Recall the properties of analytic functions for verifying C-R equations and determine Bilinear Transformation.
				CO[IV] Rewrite the order of integration using Cartesian and polar coordinates and find the area enclosed by a plane curves and volume of solids.
				CO[V] Manipulate the functions of two variables as Taylor's & Laurent's series and evaluate Contour integrals using Cauch's Integral formula.
C23	II	PH6251	Engineering Physics-II	CO[I] Illustrate Classical and Quantum free electron theory& calculate carrier concentration in metals.

				CO[II] Describe the carrier concentration in semiconductors and identify the P-type & N-type semiconductor using Hall effect.
				CO[III] Classify the different types of magnetic and superconducting materials.
				CO[IV] Explain the dielectrics, types of polarization, losses and breakdowns.
				CO[V] Discuss the properties, preparation and applications of Metallic Alloys, SMA, Nanomaterials, NLO, Biomaterials.
C24	II	CY6251	Engineering Chemistry -II	CO[I] Explain the electrochemical reaction, types of electrodes and EMF of a cell and its applications.
				CO[II] Describe the different types of corrosion & its consequences and also its prevention.
				CO[III] Explain the types of fuels like solid, liquid & gaseous. Calculate the GCV, LCV stoichio metric of fuel & air ratio and also analysis of fuel gas.
				CO[IV] Analyze the phase transitions of one & two component systems, types of alloys and their significance in industries.
				CO[V] Explain the principles and instrumentations of various spectroscopic techniques.
C25	II	EC6201	Electronic Devices	CO[I] Describe the theory, construction and operation of semiconductor diodes.
				CO[II] Explain the operation and characteristics of bipolar junction devices.
				CO[III] Explain field effect transistor characteristics and their operations.
				CO[IV] Illustrate working of various types of special semiconductor devices.
				CO[V] Explain the construction, operation and applications of power and display devices.
C26	II	EE6201	Circuit Theory	CO[I] Analyze electrical circuits using Kirchhoff's law.
				CO[II] Apply circuit theorems to evaluate AC & DC circuits.
				CO[III] Explain the concepts of resonance & coupled circuit.
				CO[IV] Analyze the transient response for AC & DC circuits.
				CO[V] Calculate the power and power factor in three phase circuits.
C27	II	GE6262	Physics and Chemistry Laboratory - II	CO[I] Appraise the Young's modulus of the beam by uniform bending method, the moment of inertia and Rigidity Modulus for thin wire using Torsion Pendulum.
				CO[II] Use Poiseuille's method for determining the coefficient of viscosity of the liquid.
				CO[III] Analyze the refractive index of spectral lines for determining the dispersive power of prism and the thickness of a thin wire through interference fringes using Air wedge apparatus.
				CO[IV] Determine the type, amount of alkalinity, hardness in given water sample and find the amount of copper using EDTA method.
				CO[V] Examine the potentiometric redox titration and Conductometric precipitation titration.

C28	II	EC6211	Circuits and Devices Laboratory	**CO[I] Observe the characteristics of diodes and transistors.**
				CO[II] Demonstrate the clipper, clamper & FWR circuits.
				CO[III] Apply KVL, KCL, Thevinin, Norton, Superposition, maximum power transfer and reciprocity theorems to DC circuits.
				CO[IV] Design serial & parallel RLC Circuits.
				CO[V] Explain the transient response of RL and RC circuits.
C31	III	MA6351	Transforms and Partial Differential Equations	CO[I] Discover the Fourier series, complex form of Fourier series, Half-range Fourier cosine and sine series for a given function and determine the Fourier coefficients using Harmonic analysis.
				CO[II] Discover the infinite complex Fourier, cosine & sine transforms and evaluate definite integrals of inverse complex Fourier, cosine & sine transforms.
				CO[III] Identify the Langrange's Linear equations, first & second order homogeneous and non homogeneous Partial Differential Equations and solve them.
				CO[IV] Solve one dimensional wave & heat equations and two dimensional heat flow equations.
				CO[V] Explain the properties of Z transform and solve the Z transform based difference equation.
C32	III	EE6352	Electrical Engineering and Instrumentation	CO[I] Explain the operation and characteristics of DC generator, DC motor and its applications.
				CO[II] Discuss the working of transformers and its performance.
				CO[III] Outline the construction and working principles of three phase & single phase Induction Motor and Synchronous Motor.
				CO[IV] Classify the static and dynamic characteristics of measurement instruments and analyze the various types of transducers.
				CO[V] Explain the application of analog and digital instruments in measurements.
C33	III	EC6301	Object Oriented Programming and Data Structures	CO[I] Solve the real world problems using various OOPS concepts and able to produce the results for complex problems.
				CO[II] Manipulate the usage of inheritance and polymorphism in building reusable code.
				CO[III] Explain the various linear data structures.
				CO[IV] Identify linear and nonlinear data structures and solve the real world problems.
				CO[V] Summarize the various searching and sorting methods.
C34	III	EC6302	Digital Electronics	CO[I] Describe different methods used for simplification of Boolean expressions.

					CO[II] Analysis of various combinational circuits and its internal structures.
					CO[III] Analysis of various sequential circuits and its internal structures.
					CO[IV] Discuss about the characteristics and structure of different memory systems.
					CO[V] Design synchronous and asynchronous sequential circuits.
C35	III	EC6303	Signals and Systems		CO[I] Classify the different types of continuous and discrete time signals and systems.
					CO[II] Apply Laplace transform & Fourier transform in continuous time signal analysis.
					CO[III] Analyze continuous time LTI systems using Fourier and Laplace Transforms.
					CO[IV] Apply Z transform and DTFT in discrete time signal analysis.
					CO[V] Analyze discrete time LTI systems using Z transform and DTFT.
C36	III	EC6304	Electronic Circuits-I		CO[I] Design electronic circuits with transistor biasing.
					CO[II] Design simple amplifier circuits.
					CO[III] Analyze the small signal equivalent circuits of transistors.
					CO[IV] Design large signal amplifiers.
					CO[V] Analyze different IC MOSFET amplifiers.
C37	III	EC6311	Analog and Digital Circuits Laboratory		CO[I] Observe the frequency response of CE/CC/CB/CS amplifiers.
					CO[II] Observe the characteristics of Darlington and differential amplifier.
					CO[III] Compute the bandwidth of single stage and multistage amplifiers.
					CO[IV] Design combinational circuits for arithmetic, code conversions and comparison operations.
					CO[V] Design sequential circuits for counter and shift register operations.
C38	III	EC6312	OOPS and Data Structures Laboratory		CO[I] Sketch the C++ program using OOPS concept.
					CO[II] Use the concepts of classes in correct manner.
					CO[III] Investigate the appropriate data structure for given problems.
					CO[IV] Examine the practical applications of data structures.
					CO[V] Test the sorting functions using C++.
C41	IV	MA6451	Probability and Random Processes		CO[I] Identify the functions of Discrete & Continuous Random variables, Moments and Moment Generating Functions.
					CO[II] Solve problems in Marginal and Conditional distributions using the concept of Correlation, Regressions and Transformation of two dimensional random variables.
					CO[III] Determine the process is either SSS or WSS and classify the TPM of Markov chain process.
					CO[IV] Analyze the Autocorrelation and Cross correlation between two random variables

					and find the Power spectral Density and Cross Power Spectral Density.
					CO[V] Compute the system transfer function and solution of Auto Correlation & Cross Correlation functions of LTI systems.
C42	IV	EC6401	Electronic Circuits - II		CO[I] Describe the concepts of feedback amplifiers.
					CO[II] Classify the various types of oscillators.
					CO[III] Design different types of tuned amplifiers and analyze its performance.
					CO[IV] Discuss various types of wave shaping circuits and multivibrators.
					CO[V] Explain the blocking oscillator and time base generator circuits.
C43	IV	EC6402	Communication Theory		CO[I] Describe the various types of amplitude modulation systems such as DSBSC, SSB and VSB.
					CO[II] Discuss the various types of angle modulation system such as narrow and wide band FM circuits.
					CO[III] Apply the concepts of Random Process to the design of communication systems.
					CO[IV] Classify the types of noise sources added in communication channel and to analyze the noise performance in AM and FM systems.
					CO[V] Discuss about information theory and compute the Huffman and Shannon-fano encoding models.
C44	IV	EC6403	Electromagnetic Fields		CO[I] Analyze field potentials due to static charges using theorems and laws such as Coulomb's Law, Gauss Law.
					CO[II] Discuss different boundary conditions for electric field and apply Poisson's & Laplace's equations to find capacitance.
					CO[III] Analyze the field potentials due to charges in static magnetic fields.
					CO[IV] Explain how materials affect magnetic fields.
					CO[V] Analyze the relation between the fields under time varying situations.
C45	IV	EC6404	Linear Integrated Circuits		CO[I] Describe the performance characteristics of operational amplifier.
					CO[II] Practice linear and non-linear operational amplifier applications such as adders, sub tractors, integrator, differentiator, log amplifiers and filters.
					CO[III] Explain the analog multiplier & PLL circuits and its applications.
					CO[IV] Explain ADC and DAC using OP-AMP.
					CO[V] Explain the applications and working principles of waveform generation circuits using special function ICs.
C46	IV	EC6405	Control System		CO[I] Compute the transfer function of different physical systems.

			Engineering	CO[II] Analyze the time domain specifications and calculate the steady state error.
				CO[III] Illustrate the frequency response characteristics of open loop and closed loop system response.
				CO[IV] Analyze the stability using Routh and root locus techniques.
				CO[V] Illustrate the state space model of a physical system and discuss the concepts of sampled data control system.
C47	IV	EC6411	Circuit and Simulation Integrated Laboratory	CO[I] Analyze various types of feedback amplifiers.
				CO[II] Design of oscillators, tuned amplifiers, wave-shaping circuits and multivibrators.
				CO[III] Demonstrate the oscillators and tuned amplifiers using SPICE Tool.
				CO[IV] Demonstrate the wave-shaping circuits and multivibrators using SPICE Tool.
				CO[V] Demonstrate the voltage and current time base circuits using SPICE Tool.
C48	IV	EC6412	Linear Integrated Circuits Laboratory	CO[I] Design of oscillators and amplifiers using Op-Amp.
				CO[II] Design of filters using Op-Amp and analyze the frequency response.
				CO[III] Investigate the working of PLL and its frequency multiplier circuit.
				CO[IV] Design of DC power supply circuit using ICs.
				CO[V] Analyze the performance of oscillators and multivibrators using PSPICE.
C49	IV	EE6461	Electrical Engineering and Control System Laboratory	CO[I] Classify the starters for various applications and test the characteristics of DC shunt machines under various conditions.
				CO[II] Compute the transfer function of a DC shunt generator and the regulation of three phase alternator.
				CO[III] Analyze the performance of a single phase transformer and performance curves of AC machines.
				CO[IV] Construct the bridge network circuit to measure the value of passive elements and analyze the stability of linear system through the simulation software.
				CO[V] Illustrate the effect of P, PI and PID controllers and design the Lead & Lag compensators.
C51	V	EC6501	Digital Communication	CO[I] Explain sampling, quantization and encoding techniques.
				CO[II] Discuss about DPCM, DM, ADPCM and ADM techniques.
				CO[III] Explain the line coding and techniques for eliminating ISI in digital communication system.
				CO[IV] Analyze the various pass band digital modulation techniques.
				CO[V] Apply error control coding techniques in digital communication system.

C52	V	EC6502	Principle of Digital Signal Processing	CO[I] Apply Discrete Fourier Transform (DFT) for the analysis of digital signals & systems.
				CO[II] Design an analog to digital Infinite Impulse Response (IIR) filters and its realization.
				CO[III] Design of digital Finite Impulse Response (FIR) filters using the windowing technique & frequency sampling method and to realize their structure.
				CO[IV] Illustrate the finite word length effects on filters.
				CO[V] Explain the fundamentals of multirate signal processing techniques.
C53	V	EC6503	Transmission Lines and Wave Guides	CO[I] Explain the different forms of Maxwell's equations.
				CO[II] Discuss the propagation of signals through transmission lines and analyze impedance matching using smith chart.
				CO[III] Illustrate uniform plane wave propagation in different mediums.
				CO[IV] Describe the transmission and reflection characteristics of plane waves at boundaries.
				CO[V] Analyze the propagation of waves in waveguides and resonators.
C54	V	GE6351	Environmental Science and Engineering	CO[I] Explain the structure and functions of different Eco Systems and Bio diversity.
				CO[II] Classify the effects and control measures of various environmental pollutions.
				CO[III] Analyze the role of an individual in conservation of various natural resources.
				CO[IV] Discuss about the various environmental protection acts.
				CO[V] Describe the impact of population growth on environment and discuss about welfare programme.
C55	V	EC6504	Microprocessor and Microcontroller	CO[I] Describe the architecture of 8086 and write its assembly language programs.
				CO[II] Discuss about the 8086 system bus structure and multiprocessor configurations.
				CO[III] Explain memory and I/O interfacing with applications such as traffic light controller, display interface and alarm controller.
				CO[IV] Describe the architecture of 8051 microcontroller and write its assembly language programs.
				CO[V] Experiment the interfacing programs such as ADC, DAC, stepper motor and waveform generation with the help of 8051 microcontroller.
C56	V	EC6511	Digital Signal Processing Laboratory	CO[I] Demonstrate the simulation of DSP systems.
				CO[II] Demonstrate the abilities of digital signal processor based DSP systems implementation.
				CO[III] Analyze the finite word length effect on DSP systems.
				CO[IV] Demonstrate the applications of FFT to DSP systems.
				CO[V] Apply the adaptive filters for various applications of DSP systems.

				CO[I] Design and verify the sampling and TDM circuits.
C57	V	EC6512	Communication Systems Laboratory	CO[II] Design and verify the AM, FM and its demodulation circuits.
				CO[III] Demonstrate the working of PCM, DM, ADM and demodulation circuits.
				CO[IV] Demonstrate band pass digital signaling schemes through simulation of FSK, PSK, QPSK and QAM techniques.
				CO[V] Compute the line coding and channel coding schemes to improve the noise performance of communication systems through simulations.
C58	V	EC6513	Microprocessor and Microcontroller Laboratory	CO[I] Implement the ALP Programs for fixed point arithmetic circuits.
				CO[II] Demonstrate the interfacing circuits for different I/Os.
				CO[III] Compile the ALP for generating waveforms such as square wave and triangular wave using microprocessors.
				CO[IV] Implement the programs in 8051 microcontroller.
				CO[V] Analyze the performance in simulator and emulator.
C61	VI	MG6851	Principles of Management	CO[I] Explain the managerial roles in local and global organization, environmental factors & strategies for International business.
				CO[II] Describe the planning process & benefits of MBO and prescribe the decision making model under different conditions.
				CO[III] Illustrate the different organization structure, Line & staff authority, staff selection & career development and performance appraisal process.
				CO[IV] Demonstrate the creativity, innovation and leadership styles through the principles of effective communication and organization culture.
				CO[V] Explain the process of control authority, budget preparation, productivity measurement and planning operations in management.
C62	VI	CS6303	Computer Architecture	CO[I] Describe data representation, instruction formats and the operation of a digital computer.
				CO[II] Illustrate the arithmetic and logic unit.
				CO[III] Discuss about implementation schemes of control unit and pipeline performance.
				CO[IV] Illustrate the parallel processing architectures.
				CO[V] Explain the performance of memory and I/O systems.
C63	VI	CS6551	Computer Networks	CO[I] Identify the components required to build different types of networks.
				CO[II] Discuss the required functionality at data link layer for an application.
				CO[III] Analyze the routing path of network.

					CO[IV] Sketch the solution for functionalities of transport layer protocol.
					CO[V] Discuss the protocols in the application layer.
C64	VI	EC6601	VLSI Design		CO[I] Outline the CMOS semiconductor technology and its principles.
					CO[II] Discuss the design principles of various combinational logic circuits for digital operations.
					CO[III] Practice the design principles of various sequential logic circuits for digital operations.
					CO[IV] Design the various arithmetic building blocks of the combinational and sequential circuits for digital operations.
					CO[V] Explain the various implementation strategies of the combinational and sequential logic circuits.
C65	VI	EC6602	Antenna and Wave Propagation		CO[I] Define the fundamentals of antenna parameters, impedance matching and dipole antennas.
					CO[II] Define the concepts of aperture antennas and understand its design procedures.
					CO[III] Explain and analyze the various types of antenna arrays, N element antenna arrays and pattern multiplication.
					CO[IV] Design and explain the principles of special antennas, EBG structures, antenna measurement procedure for radiation pattern, gain.
					CO[V] Classify the various propagation methods and understand the structure of ionosphere and its electrical properties due to the magnetic field of earth.
C66	VI	EC6001	Medical Electronics		CO[I] Discuss the terminologies of electro-physiology and its recording.
					CO[II] Describe the measurement techniques of bio-chemical and non-electrical parameters.
					CO[III] Classify the various types of assist devices.
					CO[IV] Explain the various diathermy and bio-telemetry techniques.
					CO[V] Outline current trends in medical instrumentation.
C67	VI	EC6611	Computer Networks Laboratory		CO[I] Demonstrate the communication between two desktop computers.
					CO[II] Implement the different OSI layer protocols.
					CO[III] Implement and compare the various routing algorithms.
					CO[IV] Implement the cryptography techniques.
					CO[V] Implement both wired and wireless networks.
C68	VI	EC6612	VLSI Design Laboratory		CO[I] Sketch the Verilog HDL code for basic as well as advanced digital integrated circuits.
					CO[II] Implement the integrated circuit logics into Xilinx FPGA Boards.

				CO[III] Calculate area, speed, power and delay of the integrated circuit modules.
				CO[IV] Model the analog IC blocks using EDA tools and build the GDSII format.
				CO[V] Design the digital integrated circuits and analyze its performance using internal logic analyzer.
C69	VI	GE6674	Communication and soft Skills - Laboratory	CO[I] Apply appropriate communication skills across settings, purposes and audiences.
				CO[II] Discover the knowledge of communication using technology prominent to diverse situations.
				CO[III] Dramatize the critical thinking to develop innovative and well-founded perspectives related to the students' emphases.
				CO[IV] Use of healthy and effective human relationships.
				CO[V] Demonstrate the appropriate and professional ethical behavior.
C690	VI	EC6003	Robotics and Automation	CO[I] Classify the different types of robot and their laws.
				CO[II] Explain the different types of power sources and sensors.
				CO[III] Summarize the different types of drive systems & grippers.
				CO[IV] Compute the programs for robot kinematics.
				CO[V] Summarize the different applications of robots in manufacturing sector.
C691	VI	EC6002	Advanced Digital Signal Processing	CO[I] Describe the concepts related to stationary and non-stationary random signals.
				CO[II] Express the importance of true estimation of power spectral density.
				CO[III] Design of linear and adaptive systems for filtering and linear prediction.
				CO[IV] Dramatize the concept of wavelet transforms in the context of image processing.
				CO[V] Discuss adaptive filtering techniques using LMS algorithm and the applications of adaptive filtering.
C692	VI	CS6401	Operating Systems	CO[I] Describe the Operating systems concepts.
				CO[II] Analyze various Scheduling algorithms, deadlock, prevention and avoidance algorithms.
				CO[III] Compare and contrast various memory management schemes.
				CO[IV] Illustrate prototype file systems.
				CO[V] Illustrate administrative tasks on Linux Servers.
C71	VII	EC6701	RF and Microwave Engineering	CO[I] Analyze the different low frequency parameters and S parameters and describe the RF component basics.
				CO[II] Analyze the amplifiers by means of stability, noise figures and study of various matching networks.

					CO[III] Explain the operation of passive and active microwave devices.
					CO[IV] Explain about the working principle of various microwave tubes and the limitations of conventional tubes.
					CO[V] Understand the principle of operation of measuring instruments and various microwave measuring procedures.
C72	VII	EC6702	Optical Communication and Networks		CO[I] Describe the various optical fiber modes and configurations.
					CO[II] Discuss the various signal degradation associated with optical fiber transmission.
					CO[III] Explain various optical sources and detectors.
					CO[IV] Describe the receiver operation and various fiber parameter measurements.
					CO[V] Explain the optical networks and its associated parameters on system performance.
C73	VII	EC6703	Embedded and Real Time Systems		CO[I] Describe the architecture and programming of ARM processor.
					CO[II] Outline the concepts program level in embedded processor computing.
					CO[III] Explain the basic concepts of real time Operating system.
					CO[IV] Explain the concept of design methodologies techniques for embedded system.
					CO[V] Describe Model real-time applications using embedded-system concepts.
C74	VII	IT6005	Digital Image Processing		CO[I] Explain the fundamentals of digital image processing techniques.
					CO[II] Explain the various image enhancement techniques in spatial and frequency domain.
					CO[III] Analyze the various filtering methods for image restoration and segmentation.
					CO[IV] Use various coding techniques for image compression.
					CO[V] Prescribe various features of image representation techniques.
C75	VII	EC6009	Advanced Computer Architecture		CO[I] Outline the fundamentals of Computer design.
					CO[II] Demonstrate the performance of instruction level parallelism.
					CO[III] Classify the different data level parallelism.
					CO[IV] Compare the performance of different architectures.
					CO[V] Illustrate the hardware features involved in memory and I/O.
C76	VII	EC6013	Advanced Microprocessor and Microcontroller		CO[I] Describe the architecture of Pentium processor.
					CO[II] Explain the architecture of ARM processor and Assembly Language Programming techniques.
					CO[III] Describe the ARM software application development.
					CO[IV] Illustrate the interfacing features of Motorolla68HC11 microcontroller.
					CO[V] Describe the architecture of PIC microcontroller.
C77	VII	EC6711	Embedded		CO[I] Practice to write the programs for ARM based applications.

			Laboratory	CO[II] Demonstrate the memory operations, A/D & D/A convertors using ARM system.
				CO[III] Analyze the interrupt functions in ARM based systems.
				CO[IV] Demonstrate the keyboard, display, motor and sensor interfacing units.
				CO[V] Design an ARM based system as a mini project.
C78	VII	EC6712	Optical and Microwave Laboratory	CO[I] Study the performance of analog and digital optical link.
				CO[II] Study the characteristic of various microwave active and passive components.
				CO[III] Calculate fiber bending losses, attenuation, mode characteristic and find numerical aperture.
				CO[IV] Determine the microwave parameters such as frequency, wavelength, VSWR and radiation pattern.
				CO[V] Study the DC characteristic of LED and photo diode.
C79	VII	EC6004	Satellite communication	CO[I] Explain the satellite orbits and launching procedures of satellite systems.
				CO[II] Analyze the satellite space segment and link budget design.
				CO[III] Discuss about the earth station subsystems.
				CO[IV] Apply the different accessing schemes for satellite communication systems.
				CO[V] Discuss the satellite systems with different applications.
C790	VII	EC6005	Electronic Testing	CO[I] Understand the basics of testing and the testing equipments.
				CO[II] Discuss the different testing schemes for a circuit.
				CO[III] Discuss the need for test process & design for testability.
				CO[IV] Explain the different testing equipments.
				CO[V] Describe the different testing methods & loaded board testing.
C791	VII	EC 6006	Avionics	CO[I] Describe the hardware required and need for avionics in civil, military and space systems.
				CO[II] Describe the protocols and standards for avionics bus architecture.
				CO[III] Discuss about the auto pilot and cockpit display related concepts.
				CO[IV] Explain the communication and navigation techniques used in aircrafts.
				CO[V] Explain on board navigation systems and its safety aspects.
C792	VII	CS6012	Soft Computing	CO[I] Apply various soft computing frame works.
				CO[II] Distinguish various neural networks.
				CO[III] Use fuzzy logic.
				CO[IV] Apply genetic programming.
				CO[V] Discuss hybrid soft computing.

C793	VII	EC6007	Speech Processing	CO[I] Model speech production system and describe the fundamentals of speech.	
				CO[II] Extract and compare different speech parameters.	
				CO[III] Choose an appropriate statistical speech model for a given application.	
				CO[IV] Design a speech recognition system.	
				CO[V] Use different speech synthesis techniques.	
C794	VII	EC6008	Web Technology	CO[I] Explain about the fundamental Java networking technologies.	
				CO[II] Design their own web services using the client server concepts.	
				CO[III] Describe the techniques involved to support real-time software development.	
				CO[IV] Design and create user interfaces using Java frames and applets.	
				CO[V] Create dynamic web pages using server side scripting & client side validation.	
C795	VII	EC 6010	Electronics Packaging	CO[I] Describe the evaluation of electronic systems packaging.	
				CO[II] Classify the various types of semiconductor packages.	
				CO[III] Design rules for printed wiring rules using CAD.	
				CO[IV] Choose SMD soldering methods.	
				CO[V] Explain the embedded passives like resistor and capacitor.	
C796	VII	EC6011	Electro Magnetic Interference and Compatibility	CO[I] Differentiate different types of EMI sources.	
				CO[II] Describe about different coupling mechanisms of EMI.	
				CO[III] Discover solution to EMI problems in PCB level, subsystem and system level design.	
				CO[IV] Explain about various EMI/EMC standards and regulations	
				CO[V] Calculate emission immunity level from different systems to couple with the different systems to couple with prescribed EMC standards.	
C797	VII	EC6012	CMOS Analog IC Design	CO[I] Describe the concepts of sample & hold, down sampling and over sampling.	
				CO[II] Discuss the various ADC and DAC circuit architectures.	
				CO[III] Analyze the data conversion circuit designs with better precision.	
				CO[IV] Analyze ADC/DAC Architectures and its Performance.	
				CO[V] Explain the various calibration techniques.	
C798	VII	EC6014	Cognitive Radio	CO[I] Describe the basics of the software defined radios.	
				CO[II] Explain SDR hardware and software architecture.	
				CO[III] Describe the cognitive radios and its techniques.	
				CO[IV] Develop the wireless networks based on the cognitive radios architecture.	
				CO[V] Explain the concepts behind the next generation wireless networks.	
C799	VII	EC6015	Radar and	CO[I] Discuss and drive the range equation and nature of detection.	

				Navigational Aids	CO[II] Explain MTI and pulse Doppler radar.
					CO[III] Describe detection of signals and propagation.
					CO[IV] Illustrate radio direction finding and hyperbolic systems of navigation.
					CO[V] Illustrate the navigation system using satellite.
C7990	VII	EC6016	Opto Electronic Devices		CO[I] Discuss the elements of light and semiconductor physics.
					CO[II] Describe the various display devices and LASER modes.
					CO[III] Explain the working of optical detection devices.
					CO[IV] Illustrate the types of opto electronic modulator.
					CO[V] Explain the application of optoelectronic integrated circuits.
C81	VIII	EC6801	Wireless Communication		CO[I] Discuss about wireless channels and various signaling schemes for fading channels.
					CO[II] Compare multipath mitigation techniques and analyze their performance.
					CO[III] Describe the cellular system.
					CO[IV] Analyze the various digital signaling methods and error performance in fading channels.
					CO[V] Discuss about MIMO systems with transmit/receive diversity.
C82	VIII	EC6802	Wireless Networks		CO[I] Explain the various protocols and standards of wireless LAN.
					CO[II] Describe the protocols for mobile network layer and routing in mobile ad-hoc network.
					CO[III] Illustrate the TCP for mobile transport layer.
					CO[IV] Discuss about the different wireless WAN architectures.
					CO[V] Explain the 4G technologies and its applications.
C83	VIII	GE6075	Professional Ethics in Engineering		CO[I] Describe an awareness of human values to appreciate the rights of others and stress management.
					CO[II] Illustrate the moral issues and models of professional roles.
					CO[III] Discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
					CO[IV] Describe the responsibilities, rights and assesses of the safety and risk.
					CO[V] Apply the social responsibility on multinational corporations related to engineering.
C84	VIII	GE6751	Total Quality Management		CO[I] Define the need and dimensions of quality and to discuss the contributions made by Juran, Crosby and Deming.
					CO[II] Explain the TQM principles such as leadership, quality plan, customer focus, employee involvement and six sigma concepts.

				CO[III] Discuss the benchmarking process and various stages of FMEA.
				CO[IV] Describe various tools and techniques of TQM such as QFD, Taguchi quality loss function and TPM.
				CO[V] Illustrate the need of ISO 9000, QS 9000, ISO 14000 quality system elements, documentation and quality audit.
C85	VIII	EC6811	Project Work	CO[I] Identify challenging practical problems, solutions to cope up with present scenario of Electronics and Communication Engineering field.
				CO[II] Analyze the various methodologies and technologies and discuss with team for solving the problem.
				CO[III] Apply technical knowledge and project management skills for solving the problem.
				CO[IV] Design and develop hardware and/or software for their project specific problem.
				CO[V] Prepare the project reports and give proper explanation during the presentation and demonstration.
C86	VIII	EC6017	RF System Design	CO[I] Discuss about the transceiver specifications and architectures.
				CO[II] Design a high frequency amplifier by applying impedance matching techniques.
				CO[III] Interpret the stability of feedback systems and describe about the design considerations for power amplifiers.
				CO[IV] Explain the model of PLL and its applications.
				CO[V] Describe about the different types of mixer and oscillators.
C87	VIII	CS6003	Ad hoc and Sensors Networks	CO[I] Classify the radio propagation mechanism and application of wireless networks.
				CO[II] Classify the different types MAC protocol.
				CO[III] Summarize the Routing protocols for wireless networks.
				CO[IV] Summarize the Wireless Sensor Network with IEEE 802.15.4.
				CO[V] Explain the QOS and Localization of wireless sensor network.
C88	VIII	EC6018	Multimedia Compression and Communication	CO[I] Describe various multimedia components.
				CO[II] Discuss the various audio and video compression techniques.
				CO[III] Discuss the various text and image compression techniques.
				CO[IV] Analyze the VoIP technology.
				CO[V] Apply the compression concepts in multimedia communication.
C89	VIII	GE6082	Indian Constitution and Society	CO[I] Explain the concepts of constitution of Indian government.
				CO[II] Describe the structure, functions, rules and regulations of the central government.
				CO[III] Describe the structure, functions, rules and regulations of the state government.

				CO[IV] Summarize the Indian constitution functions in terms of the central and state governments.
				CO[V] Appraise the different culture among the peoples in Indian society.
C890	VIII	MG6071	Entrepreneurship Development	CO[I] Describe the concepts of entrepreneurship.
				CO[II] Summarize the motives, objectives and achievements of entrepreneur.
				CO[III] Explain the various business models and choosing the suitable business.
				CO[IV] Express the financial structures and its accounting methods of the business.
				CO[V] Discuss the various entrepreneur supporting systems and its procedures.
C891	VIII	MG6088	Software Project Management	CO[I] Outline the project evaluation and planning process.
				CO[II] Explain the different techniques for managing the project life cycle and cost estimation.
				CO[III] Describe the various project activity planning and risk management methods.
				CO[IV] Illustrate the different frameworks for project management and its control techniques.
				CO[V] Discuss the staffing techniques in software projects.
C892	VIII	EC6019	Data Converters	CO[I] Explain the concepts of sample and hold circuits.
				CO[II] Discuss dimensions and bias conditions of the MOS transistor design.
				CO[III] Analyze the design calculations for developing the various blocks associated with a typical CMOS AD or DA converter.
				CO[IV] Analyze ADC/DAC architecture and its performance.
				CO[V] Discuss the various calibration techniques.
C893	VIII	CS6701	Cryptography and Network Security	CO[I] Explain the OSI security architecture with number theory.
				CO[II] Classify the different types Key cryptography.
				CO[III] Summarize the Hash functions and digital signatures in network security.
				CO[IV] Design various system security authentication and application in IDS and Firewall.
				CO[V] Summarize the various security services for Email in network security.