ANNA UNIVERSITY CHENNAI

KATHIR COLLEGE OF ENGINEERING, COIMBATORE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

R2017 REGULATION

PROGRAMME OUTCOMES (POs)

Students graduating from Electronics and communication Engineering should be able to:

PO1.Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2.Problem analysis: Identity, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3.Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4.Conduct investigations of complex problems: Use research – based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5.Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and writeeffective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in self, and lifelong learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOME (PSOs)

PSO1: To apply the Engineering knowledge to develop Innovative Ideas for existing / Novel problems through information and communication technologies (ICT).

PSO2: To design the Analog and Digital system and practice for Developing Quality products.

PSO3: Understand social needs and environmental concerns with ethical responsibility to become a successful professional.

COURSE OUTCOMES

I - SEMESTER	
Course code	**C101**
Subject code	**HS8151**
Subject name	**Communicative English**
COURSE OUTCOMES	
CO1	Read articles of a general kind in magazines and newspapers.
CO2	Participate effectively in informal conversations introduce themselves and their friends and express opinions in English.
CO3	Comprehend conversations and short talks delivered in English.
CO4	Write short essays of a general kind and personal letters and emails in English.

Course code	C102
Subject code	MA8151
Subject name	Engineering Mathematics – I
COURSE OUTCOMES	
CO1	Use both the limit definition and rules of differentiation to differentiate functions.
CO2	Apply differentiation to solve maxima and minima problems.
CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
CO5	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.

Course code	C103
Subject code	PH8151
Subject name	Engineering Physics
COURSE OUTCOMES	
CO1	Classify the Bravais lattices and different types of crystal structures and growth techniques.
CO2	Demonstrate the properties of elasticity and heat transfer through objects.
CO3	Discuss black body radiation, properties of matter waves and Schrodinger wave equations.
CO4	Illustrate the acoustic requirements, production and application of ultrasonics.
CO5	Examine the characteristics of laser and optical fiber.

Course code	C104
Subject code	CY8151
Subject name	Engineering Chemistry
COURSE OUTCOMES	
CO1	Identify the characteristics of water and treatment techniques.
CO2	Gain the knowledge about surface chemistry and catalysis.
CO3	Competent the basic concept of phase rule and its applications.
CO4	Grasp the knowledge of fuels and classification.
CO5	Compare the strengths and limitations of energy sources.

Course code	C105
Subject code	GE8151
Subject name	Problem Solving and Python Programming
COURSE OUTCOMES	
CO1	Develop algorithmic solutions to simple computational problems.
CO2	Read, write, execute by hand simple Python programs.
CO3	Structure simple Python programs for solving problems.
CO4	Decompose a Python program into functions.
CO5	Represent compound data using Python lists, tuples, dictionaries. Read and write data from/to files in Python Programs.

Course code	C106
Subject code	GE8152
Subject name	ENGINEERING GRAPHICS
COURSE OUTCOMES	
CO1	Perform free hand sketching of basic geometrical constructions and multiple views of objects.
CO2	Do orthographic projection of lines and plane surfaces.
CO3	Draw projections and solids and development of surfaces.
CO4	Prepare isometric and perspective sections of simple solids.
CO5	Demonstrate computer aided drafting.

Course code	C107
Subject code	GE8161
Subject name	Problem Solving and Python Programming Laboratory
COURSE OUTCOMES	
CO1	Write and test and debug simple python programs.
CO2	Design conditions and loop concepts in python.
CO3	Develop a python programs to implement functions and calling function concepts.
CO4	Execute list, tuple, dictionaries concept in python.
CO5	Execute file concepts in python programs.

Course code	C108
Subject code	BS8161
Subject name	Physics and Chemistry Laboratory
COURSE OUTCOMES	
CO1	Apply physics principles of optics and thermal physics to evaluate engineering properties of materials.
CO2	Outfit with hands-on knowledge in the quantitative chemical analysis of water quality related parameters
CO3	Determine the DO content in water sample by winkler's method and molecular weight of polymer by Ostwald viscometer.
CO4	Find the strength of an acid using pH meter and conductometer
CO5	Estimate the amount of weak and strong acids in a mixture by conductometer

II - SEMESTER	
Course code	**C109**
Subject code	**HS8251**
Subject name	**Technical English**
COURSE OUTCOMES	
CO1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
CO2	Write effectively and persuasively and produce different types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing.
CO3	Read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentation.
CO4	Listen/view and comprehend different spoken excerpts critically and infer unspoken and implied meanings.

Course code	**C110**
Subject code	**MA8251**
Subject name	**Engineering Mathematics – II**
COURSE OUTCOMES	
CO1	Develop the fundamentals and basic concepts in vector calculus, ODE, Laplace transform and complex functions.
CO2	Solve problems related to engineering applications by using these techniques.
CO3	To have an ability of mathematical modelling of systems using differential equations and ability to solve the differential equations.
CO4	Use Green's theorem to evaluate line integrals along simple closed contours on the plane and use Stokes' theorem to give a physical interpretation of the curl of a vector field.
CO5	Expand functions of two variables as Taylor's and Laurent's series and evaluate Contour integrals using Cauchy's formula.

Course code	C111
Subject code	PH8253
Subject name	Physics for Electronics Engineering
COURSE OUTCOMES	
CO1	Gain knowledge on classical and quantum electron theories, and energy band structures.
CO2	Analyze the basics of semiconductor physics and its applications in various devices.
CO3	Analyze on magnetic and dielectric properties of materials.
CO4	Describe the functioning of optical materials for optoelectronics.
CO5	Discuss of quantum structures and their applications in spintronics and carbon electronic.

Course code	C112
Subject code	BE8254
Subject name	Basic Electrical and Instrumentation Engineering
COURSE OUTCOMES	
CO1	Understand the basic concepts and laws of DC and AC electrical networks and solve them using mesh and nodal analysis techniques.
CO2	Knowledge of the Circuit components, parameters and theorems related to AC and DC circuit analysis.
CO3	Ability to apply the concepts of resonance, transients and coupled circuits to design, develop, and analyze the electric circuits, thus improving the problem solving skills.
CO4	Apply time and frequency concepts of analysis.
CO5	Understand various functions of network and also the stability of network and Synthesize the network using passive elements.

Course code	C113
Subject code	EC8251
Subject name	Circuit Analysis
COURSE OUTCOMES	
CO1	Analyze electrical circuits using Kirchhoff's law.
CO2	Apply circuit theorems to evaluate AC & DC circuits.
CO3	Summarize the concepts of resonance & coupled circuit.
CO4	Analyze the transient response for AC & DC circuits.
CO5	Calculate the power and power factor in three phase circuits.

Course code	C114
Subject code	EC8252
Subject name	Electron Devices
COURSE OUTCOMES	
CO1	Able to understand the characteristics of semiconductor diodes.
CO2	Gain the knowledge on BJT transistor characteristics.
CO3	Analyze the operation of the various bias circuits of MOSFET.
CO4	Analyze the operation of semiconductor devices.
CO5	To understand the operation and design various types of power amplifier circuits.

Course code	C115
Subject code	EC8261
Subject name	Circuits and Devices Laboratory
COURSE OUTCOMES	
CO1	Determine the characteristics of diodes and transistors.
CO2	Demonstrate the clipper, clamper & FWR circuits.
CO3	Apply KVL, KCL, Thevenin, Norton, Superposition, maximum power transfer and reciprocity theorems to DC circuits.
CO4	Design serial & parallel RLC Circuits.
CO5	Analyze transient response of RL and RC circuits.

Course code	C116
Subject code	GE8261
Subject name	Engineering Practice Laboratory
COURSE OUTCOMES	
CO1	Make use of wiring circuits for residential house, fluorescent lamp and stair case.
CO2	Classify the electrical quantities of V, I & PF in RLC and energy with single phase energy meter.
CO3	Demonstrate the logic gates and electronic components.
CO4	Manipulate PCB with electronic components, devices and circuits for general purposes.
CO5	Perform HWR & FWR with ripple factor and clock signal generation.

III - SEMESTER	
Course code	**C201**
Subject code	**MA 8353**
Subject name	**TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS**
COURSE OUTCOMES	
CO1	Apply Fourier series analysis in Engineering problems.
CO2	Classify and solve wave equations and heat equations.
CO3	Solve problems related to engineering applications by using Fourier transform techniques.
CO4	Solve discrete transforms and difference equations.
CO5	Formulate and solve problems involving Partial Differential Equations.

Course code	**C202**
Subject code	**EC8393**
Subject name	**Fundamentals of Data structure in C**
COURSE OUTCOMES	
CO1	Apply the concepts of arrays and strings in different applications using C.
CO2	Apply linear and non-linear data structure operations using C.
CO3	Illustrate operations like searching, insertion, and deletion, traversing mechanism etc. on various data structures.
CO4	Appropriately choose new data structure for an application.
CO5	Design appropriate sorting/searching technique for given problem.

Course code	**C203**
Subject code	**EC8351**
Subject name	**Electronic Circuits I**
COURSE OUTCOMES	
CO1	Design and troubleshoot the regulated DC power supplies.
CO2	Characterize various biasing methods for amplifier circuits.
CO3	Perform small signal analysis of BJT, FET transistors for single-stage and multi stage amplifiers.
CO4	Analyze the characteristics of large signal power amplifiers.
CO5	Analyze low frequency and high frequency analysis of BJT and FET Amplifiers.

Course code	C204
Subject code	EC 8352
Subject name	Signals and Systems
COURSE OUTCOMES	
CO1	Apply the transforms in analysis of signals and system in continuous and discrete time domain.
CO2	Develop input output relationship for linear shift invariant system and evaluate the time and frequency response.
CO3	Analyze the limitations of Fourier transform and need for Laplace transform to analyze the system in s - domain.
CO4	Evaluate the signals in frequency domain using Fourier series and Fourier transforms.
CO5	Analyze discrete time LTI systems using Z transform and DTFT.

Course code	C205
Subject code	EC 8392
Subject name	Digital Electronics
COURSE OUTCOMES	
CO1	Analyze different methods used for simplification of Boolean expressions.
CO2	Analyze and design various combinational circuits using logic gates.
CO3	Design and analyze the timing properties of sequential circuits using state machines.
CO4	Design and develop various modes of asynchronous sequential circuits.
CO5	Synthesize combinational and sequential circuits using Verilog HDL.

Course code	C206
Subject code	EC8391
Subject name	Control Systems Engineering
COURSE OUTCOMES	
CO1	Figure out the various control system components and their representations.
CO2	Examine the various time domain parameters and Analysis the various frequency response plots and its system.
CO3	Work the concepts of various system stability criterions.
CO4	Figure various transfer functions of digital control system using state variable models.
CO5	Illustrate the state space model of physical system.

Course code	C207
Subject code	EC8381
Subject name	Fundamentals of Data Structure in C laboratory
COURSE OUTCOMES	
CO1	Demonstrate the C++ programs for manipulatingconstructors, destructors, overloading concepts.
CO2	Apply data structures such as arrays, linked lists in various applications.
CO3	Execute the different data structures like stacks and queues for developing solutions to practical problems.
CO4	Perform with Stack ADT Array and linked list implementations and theirapplication.
CO5	Apply the concept of Heap Sort, Quick Sort program counter and status register.

Course code	C208
Subject code	EC8361
Subject name	Analog and Digital Circuits Laboratory
COURSE OUTCOMES	
CO1	Design the combinational circuits using standard gates and classify minimization methods.
CO2	Design and analyze the frequency Response of Amplifiers.
CO3	Apply various sequential circuits using Flip-flops.
CO4	Design rectifiers using active and passive elements.
CO5	Simulate Amplifier using SPICE.

Course code	**C209**
Subject code	**HS8381**
Subject name	**Interpersonal skills/ Listening and Speaking**
COURSE OUTCOMES	
CO1	Complete course outline/Course Objectives/Learning Outcomes/ Evaluation Pattern & Assignments.
CO2	Demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary & Grammar.
CO3	Participate in an online learning environment successfully by developing the Implication-based understanding of Paraphrasing, deciphering instructions, interpreting guidelines, discussion boards & Referencing Styles.
CO4	Discuss about effective presentations.
CO5	Participate confidently and appropriately in conversations both formal and informal.

IV - SEMESTER	
Course code	**C210**
Subject code	**MA8451**
Subject name	**Probability and Random Process**
COURSE OUTCOMES	
CO1	Identify the functions of discrete & continuous random variables, moments and moment generating functions.
CO2	Solve problems in marginal and conditional distributions using the concept of correlation, regressions and transformation of two dimensional random variables.
CO3	Determine the process is either SSS or WSS and classify the TPM of Markov chain process.
CO4	Analyse the autocorrelation and cross correlation between two random variables.
CO5	Evaluate the power spectral density and cross power spectral density.

Course code	C211
Subject code	CE8452
Subject name	Electronic Circuits II
COURSE OUTCOMES	
CO1	Examine the concepts of feedback amplifiers.
CO2	Classify the various types of oscillators.
CO3	Design different types of tuned amplifiers and analyze its performance.
CO4	Discuss various types of wave shaping circuits and multivibrators.
CO5	Design the blocking oscillator and time base generator circuits.

Course code	C212
Subject code	EC8491
Subject name	Communication Theory
COURSE OUTCOMES	
CO1	Analyze amplitude modulation systems such as DSBSC, SSB and VSB.
CO2	Discuss the various types of angle modulation system such as narrow and wide band FM circuits.
CO3	Apply the concepts of Random Process to the design of communication systems.
CO4	Classify the types of noise sources added in communication channel.
CO5	Discuss about information theory and compute the Huffman and Shannon-fanon encoding models.

Course code	C213
Subject code	EC8451
Subject name	Electromagnetic Fields
COURSE OUTCOMES	
CO1	Analyze field potentials due to static charges using theorems and laws such as Coulomb's Law, Gauss Law.
CO2	Discuss different boundary conditions for electric field and apply Poisson's & Laplace's equations to find capacitance.
CO3	Analyze the field potentials due to charges in static magnetic fields.
CO4	Analyze the materials affect magnetic fields.
CO5	Analyze the relation between the fields under time varying situations.

Course code	C214
Subject code	EC8453
Subject name	Linear Integrated Circuits
COURSE OUTCOMES	
CO1	Analyze performance characteristics of operational amplifier.
CO2	Practice linear and non-linear operational amplifier applications such as adders, sub tractors, integrator, differentiator, log amplifiers and filters.
CO3	Implement the applications using analog multiplier and PLL.
CO4	Construct ADC and DAC using OP – AMPS.
CO5	Determine waveforms using OP – AMP Circuits.

Course code	C215
Subject code	GE8291
Subject name	Environmental Science and Engineering
COURSE OUTCOMES	
CO1	Analyze structure and functions of different Eco Systems and Bio diversity.
CO2	Classify the effects and control measures of various environmental pollutions.
CO3	Analyze the role of an individual in conservation of various natural resources.
CO4	Discuss about the various environmental protection acts.
CO5	Analyze the impact of population growth on environment and discuss about welfare programme.

Course code	C216
Subject code	EC6411
Subject name	Circuits and Simulation Integrated Laboratory
COURSE OUTCOMES	
CO1	Analyze various types of feedback amplifiers.
CO2	Design of oscillators, tuned amplifiers, wave-shaping circuits.
CO3	Demonstrate the oscillators and tuned amplifiers using SPICE.
CO4	Demonstrate the wave-shaping circuits and multivibrators using SPICE.
CO5	Demonstrate the voltage and current time base circuits using SPICE.

Course code	C217
Subject code	EC8462
Subject name	Linear Integrated Circuits Laboratory
COURSE OUTCOMES	
CO1	Design of oscillators and amplifiers using Op-Amp.
CO2	Design of filters using Op-Amp and analyze the frequency response.
CO3	Investigate the working of PLL and its frequency multiplier circuit.
CO4	Design of DC power supply circuit using ICs.
CO5	Analyze the performance of oscillators and multi vibrators using PSPICE.

V - SEMESTER	
Course code	C301
Subject code	EC 8501
Subject name	Digital Communication
COURSE OUTCOMES	
CO1	Analyze the sampling, quantization and encoding techniques.
CO2	Analyze the DPCM, DM, ADPCM and ADM techniques.
CO3	Analyze the line coding and techniques for eliminating ISI in digital communication system.
CO4	Design and implement base band transmission and reception schemes and implement band pass signaling schemes.
CO5	Apply error control coding techniques in digital communication system.

Course code	C302
Subject code	EC8553
Subject name	Discrete Time Signal Processing
COURSE OUTCOMES	
CO1	Apply DFT and FFT for the analysis of digital signals and systems.
CO2	Design and analysis of IIR, FIR digital filters.
CO3	Apply effects of finite precision representation on digital filters.
CO4	Design multi rate filters.
CO5	Apply adaptive filters appropriately in communication systems.

Course code	C303
Subject code	EC8552
Subject name	Computer Architecture and Organization
COURSE OUTCOMES	
CO1	Discuss data representation, instruction formats and the operation of a digital computer.
CO2	Illustrate the arithmetic and logic unit.
CO3	Discuss about development schemes of control unit and pipeline performance.
CO4	Illustrate the parallel processing architectures.
CO5	Examine the performance of memory and I/O systems.

Course code	C304
Subject code	EC8551
Subject name	Computer Networks
COURSE OUTCOMES	
CO1	Identify the components required to build different types of networks.
CO2	Discuss the required functionality at data link layer for an application.
CO3	Analyze the routing path of network.
CO4	Sketch the solution for functionalities of transport layer protocol.
CO5	Discuss the protocols in the application layer.

Course code	C305
Subject code	EC8073
Subject name	Medical Electronics
COURSE OUTCOMES	
CO1	Discuss the terminologies of electro-physiology and its recording.
CO2	Analyze the measurement techniques of bio-chemical and non-electrical parameters.
CO3	Classify the various types of assist devices.
CO4	Categorize the various diathermy and bio-telemetry techniques.
CO5	Outline current trends in medical instrumentation.

Course code	C306
Subject code	OR0511
Subject name	Renewable Energy
COURSE OUTCOMES	
CO1	Discuss on solar radiation and its environmental impact to power.
CO2	Analyze the various collectors used for storing solar energy.
CO3	Analyze the various applications in solar energy.
CO4	Discuss about the wind energy and biomass and its economic aspects.
CO5	Gather the knowledge about geothermal energy with other energy sources.

Course code	C307
Subject code	EC8562
Subject name	Digital Signal Processing Laboratory
COURSE OUTCOMES	
CO1	Develop and experiment coding from basic mathematical operations to complex operations like DFT and FFT.
CO2	Analyze the amplitude and phase spectrum of the signal in frequency domain.
CO3	Analyze the finite word length effect on DSP systems.
CO4	Apply the FFT techniques for various applications of DSP systems.
CO5	Apply the adaptive filters for various applications of DSP systems.

Course code	C308
Subject code	EC8561
Subject name	Communication System Laboratory
COURSE OUTCOMES	
CO1	Design and verify the sampling & reconstruction and TDM circuits.
CO2	Design and verify the AM, FM and its demodulation circuits.
CO3	Describe the working of PCM, DM, ADM and demodulation circuits.
CO4	Design band pass digital signaling schemes through simulation for FSK, PSK, QPSK and QAM techniques.
CO5	Compute the line coding schemes to improve the noise performance of communication systems through simulations.

Course code	C309
Subject code	EC8563
Subject name	Communication Network Laboratory
COURSE OUTCOMES	
CO1	Demonstrate the communication between two desktop computers.
CO2	Elaborate the different protocols used in computer communication.
CO3	Develop and compare the various routing algorithms.
CO4	Develop the cryptography techniques.
CO5	Develop both wired and wireless networks.

VI – SEMESTER	
Course code	C310
Subject code	EC8691
Subject name	Microprocessor and Microcontroller
COURSE OUTCOMES	
CO1	Illustrate the architecture of 8086 and write its assembly language programs.
CO2	Develop the 8086 system bus structure and multiprocessor configurations.
CO3	Discuss memory and I/O interfacing with applications such as traffic light controller, display interface and alarm controller.
CO4	Define the architecture of 8051 microcontroller and write its assembly language programs.
CO5	Experiment the interfacing programs such as ADC, DAC, stepper motor

	and waveform generation with the help of 8051 microcontroller.

Course code	**C311**
Subject code	**EC8095**
Subject name	**VLSI Design**
COURSE OUTCOMES	
CO1	Outline the CMOS semiconductor technology and its principles.
CO2	Discuss the design principles of various combinational logic circuits for digital operations.
CO3	Design the various arithmetic building blocks of the combinational and sequential circuits.
CO4	Experiment with the design principles of various sequential logic circuits for digital operations.
CO5	Interpret the various implementation strategies of the combinational and sequential logic circuits.

Course code	**C312**
Subject code	**EC8652**
Subject name	**Wireless Communication**
COURSE OUTCOMES	
CO1	Discuss about wireless channels and various signaling schemes for fading channels.
CO2	Compare multipath mitigation techniques and analyze their performance.
CO3	Examine the cellular system.
CO4	Analyze the various digital signaling methods and error performance in fading channels.
CO5	Discuss about MIMO systems with transmit/receive diversity.

Course code	C313
Subject code	MG8591
Subject name	Principles of Management
COURSE OUTCOMES	
CO1	Discuss the managerial roles in local and global organization, environmental factors &Strategies for International business.
CO2	List the planning process & benefits of MBO.
CO3	Infer the decision making model under different conditions.
CO4	Illustrate the different organization structure, Line & staff authority, staff selection & Career development and performance appraisal process.
CO5	Demonstrate the creativity, innovation and leadership styles through the principles of effective communication and organization culture.

Course code	C314
Subject code	EC8651
Subject name	Transmission Lines and RF systems
COURSE OUTCOMES	
CO1	Analyze the characteristics of transmission lines and its losses.
CO2	Write about the standing wave ratio and input impedance in high frequency transmission lines.
CO3	Technical knowledge in impedance matching using smith chart.
CO4	Identify passive filters and has basic knowledge of active RF components.
CO5	Analyze the characteristics of TE and TM waves.

Course code	C315
Subject code	EC8004
Subject name	Wireless Networks
COURSE OUTCOMES	
CO1	Categorize the various protocols and standards of wireless LAN.
CO2	Describe the protocols for mobile network layer and routing in mobile ad-hoc network.
CO3	Illustrate the TCP for mobile transport layer.
CO4	Discuss about the different wireless WAN architectures.
CO5	Summarize the 4G technologies and its applications.

Course code	C316
Subject code	EC8681
Subject name	Microprocessor and Microcontroller Laboratory
COURSE OUTCOMES	
CO1	Develop the ALP Programs for fixed point arithmetic circuits.
CO2	Design and develop programs on 8086 microprocessor by understanding its architecture, instruction set and interrupt process.
CO3	Compile the ALP for generating waveforms such as square wave and triangular wave using microprocessors.
CO4	Design a communication interface by understanding the system bus structure of 8086 microprocessor.
CO5	Develop the programs in 8051 microcontroller for ADC, DAC, stepper motor.

Course code	C317
Subject code	EC8661
Subject name	VLSI DesignLaboratory
COURSE OUTCOMES	
CO1	Design the Verilog HDL code for basic as well as advanced digital integrated circuits.
CO2	Develop the integrated circuit logics into Xilinx FPGA Boards.
CO3	Calculate area, speed, power and delay of the integrated circuit modules.
CO4	Model the analog IC blocks using EDA tools and build the GDSII format.
CO5	Design the digital integrated circuits and analyze its performance using internal logic analyzer.

VII - SEMESTER	
Course code	**C401**
Subject code	**EC8701**
Subject name	**ANTENNAS AND MICROWAVE ENGINEERING**
COURSE OUTCOMES	
CO1	Understand the basic principles in antenna and microwave system design
CO2	Analyze the area of various antenna designs .
CO3	Design antenna arrays and its applications
CO4	Describe the operation of passive and active microwave devices.
CO5	Analyze the principle of operation of measuring instruments.

Course code	**C402**
Subject code	**EC8751**
Subject name	**OPTICAL COMMUNICATION**
COURSE OUTCOMES	
CO1	Study about the various optical fiber modes, configuration and transmission characteristics of optical fibers
CO2	Learn about the various optical sources, detectors and transmission techniques
CO3	Explore various idea about optical fiber measurements and various coupling techniques
CO4	Enrich the knowledge about optical communication systems and networks
CO5	Infer the optical networks and its associated parameters on system performance.

Course code	C403
Subject code	EC8791
Subject name	EMBEDDED AND REAL TIME SYSTEMS
COURSE OUTCOMES	
CO1	Develop the architecture and programming of ARM processor.
CO2	Outline the concepts program level in embedded processor computing.
CO3	Discuss the basic concepts of real time Operating system.
CO4	Illustrate the concept of design methodologies techniques for embedded system.
CO5	Evaluate the performance of various RTOS mechanisms.

Course code	C404
Subject code	EC8702
Subject name	AD HOC AND WIRELESS SENSOR NETWORKS
COURSE OUTCOMES	
CO1	Learn Ad hoc network and Sensor Network fundamentals.
CO2	Understand the different routing protocols.
CO3	In-depth knowledge on sensor network architecture and design issues
CO4	Understand the transport layer and security issues possible in Ad hoc and Sensor networks.
CO5	Exposure to mote programming platforms and tools.

Course code	C405
Subject code	EC8711
Subject name	Embedded Laboratory
COURSE OUTCOMES	
CO1	Create the programs for ARM based applications.
CO2	Demonstrate the memory operations, A/D & D/A convertors using ARM system.
CO3	Analyze the interrupt functions in ARM based systems.
CO4	Demonstrate the keyboard, display, motor and sensor interfacing units.
CO5	Evaluate the ARM performance for various optimizations.

Course code	C406
Subject code	EC8761
Subject name	ADVANCED COMMUNICATION LABORATORY
COURSE OUTCOMES	
CO1	Understand the working principle of optical sources, detector, fibers.
CO2	Develop understanding of simple optical communication link.
CO3	Understand the measurement of BER, Pulse broadening.
CO4	Understand and capture an experimental approach to digital wireless communication.
CO5	Understand actual communication waveforms that will be sent and received across wireless channel.

VIII - SEMESTER	
Course code	C407
Subject code	EC8811
Subject name	Project work
COURSE OUTCOMES	
CO1	Identify challenging practical problems, solutions to cope up with present scenario of Electronics and Communication Engineering field.
CO2	Analyze the various methodologies and technologies and discuss with team for solving the problem.
CO3	Apply technical knowledge and project management skills for solving the problem.
CO4	Design and develop hardware and/or software for their project specific problem.
CO5	Formulate the project reports and give proper explanation during the presentation and demonstration.