MAHENDRA COLLEGE OF ENGINEERING
(Approved by AICTE, Affiliated to Anna University, Chennai-25)
Chennai Main Road, Minnampalli
Salem – 636106

B.E. ELECTRONICS AND COMMUNICATION ENGINEERING

Program Outcomes (POs)

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

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

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.

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.

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.

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.

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.

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

Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

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.

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

Program Specific Outcomes (PSOs)

The students will demonstrate the abilities

PSO1: To understand and apply the fundamental concepts of core Electronics and Communication Engineering subjects to meet the global industrial challenges.

PSO2: To enhance the competence in using modern IT tools for the design and analysis of complex electronic systems in furtherance to employability and research activities.

PSO3: To provide conducive environment to develop professionalism, entrepreneurial skills and leadership qualities with ethical integrity.

MAHENDRA COLLEGE OF ENGINEERING
(Approved by AICTE, Affiliated to Anna University, Chennai-25)
Chennai Main Road, Minnampalli
Salem – 636106

COURSE OUTCOME STATEMENTS FOR B.E.ELECTRONICS AND COMMUNICATION ENGINEERING (2013 REGULATION)

SEMESTER 01

1.Course Code and Name : HS6151 - TECHNICAL ENGLISH I

	CO Statements	Knowledge Level
The students should be able to		

1	Classify the types of listening and writing skills with acquired knowledge	K2
2	Demonstrate speaking skills in various occasions	K2
3	Compare the formal and informal writing skills by using the mail and blocks	K2
4	Apply the speaking etiquitte to build up communication proficiency	K3
5	Develop presentations with the use of LSRW skills	K3

2.Course Code and Name : MA6151 - MATHEMATICS I	
CO Statements	**Knowledge Level**
The students should be able to	

1	Solve the Eigen values and Eigen vectors to diagonalise and reduce a matrix to quadratic form	K3
2	Identify the convergences, divergences of infinite series	K3
3	Solve evolutes and envelopes of a given curve by using radius of curvature and center of curvature	K3
4	Identify the maxima and minima value functions of two variables	K3
5	Solve area of plain curves and volume of solid using double and triple integrals	K3

3.Course Code and Name : PH6151 - ENGINEERING PHYSICS I	
CO Statements	**Knowledge Level**
The students should be able to	

1	Explain the basics of properties of matter and its applications	K2
2	Summarize the concepts of waves and optical devices and their applications in fiber optics	K2
3	Demonstrate the concepts of thermal properties of materials and their applications in expansion joints and heat	K2
4	Outline the concepts of advanced physics quantum theory and its applications in tunneling microscopes	K2
5	Explain the basics of crystals, their structures and different crystal growth techniques	K2

4.Course Code and Name : CY6151 - ENGINEERING CHEMISTRY I	
CO Statements	**Knowledge Level**
The students should be able to	

1	Classify the polymers and their utility in the industries and explain the techniques of polymerization and	K2
2	Relate various thermodynamic functions such as enthalpy, entropy, free energy and their importance	K2

3	Explain the photo physical processes such as fluorescence and phosphorescence and various components of		K2
4	Illustrate the phase transitions of one component and two component systems and the types of alloys and their		K2
5	Outline the synthesis, characteristics and the applications of nano materials		K2

5.Course Code and Name : GE6151- COMPUTER PROGRAMMING		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Describe the function of a Computer and problem solving techniques.	K2
2	Write simple C programs using basic constructs	K3
3	Implement applications to manage data using arrays and strings	K3
4	Apply functions and pointers for solving problems	K3
5	Develop simple applications using structure and union	K3

6.Course Code and Name : GE6152- ENGINEERING GRAPHICS		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Demonstrate freehand sketching of basic geometrical constructions and multiple views of objects	K2
2	Develop orthographic projections of points, lines and plane surfaces	K3
3	Construct projections of simple solids and truncated solids	K3
4	Develop projection of sectioned solids and utilize development of surfaces	K3
5	Construct isometric and perspective projections of simple solids	K3

7.Course Code and Name : GE6161- COMPUTER PRACTICES LABORATORY		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply the usage of office automation tools.	K2
2	Apply good programming design methods for program development.	K3
3	Design and implement C programs for simple applications.	K3
4	Develop recursive programs.	K3

	8.Course Code and Name : GE6162 - ENGINEERING PRACTICES LABORATORY	
	CO Statements	**Knowledge Level**
The students should be able to		
1	Construct carpentry components and pipe connections including plumbing works	K2
2	Make use of welding equipments to join the structures	K3
3	Develop models using sheet metal work	K3
4	Illustrate the working of centrifugal pump and air conditioner	K3
5	Demonstrate basic home electrical works, measurement of the electrical quantities and soldering practices	K3
	9.Course Code and Name : GE6163 - PHYSICS AND CHEMISTRY LABORATORY - I	
	CO Statements	**Knowledge Level**
The students should be able to		
1	Make use of spectrometer to find the wavelength of spectral lines, and laser	K3
2	Make use of ultrasonic interferometer and Lee's disc apparatus to find the velocity of sound, compressibility	K3
3	Demonstrate the estimation of DO content in water sample by Winkler's method and molecular weight of	K2
4	Experiment with the strength of an acid using pH meter and conductometer	K3
5	Demonstrate the estimation of weak and strong acids in a mixture by conductometer	K2
	SEMESTER 02	
	1.Course Code and Name : HS6251 - TECHNICAL ENGLISH II	
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop the communication skills with proper grammar usage	K2
2	Summarize the various advanced technical and non-technical english tools	K2
3	Classify the speaking skills and expression through professional english	K2

4	Apply the interview techniques for career development	K3
5	Outline the use of writing skills to express innovatiove ideas	K3

2.Course Code and Name : MA6251 - MATHEMATICS II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Apply solenoidal, irrotational vectors and make use of the concepts of Green's, Gauss divergence , Stokes theorem to evaluate single, double and triple integrals	K3
2	Solve simultaneous linear equations and P.I. of Cauchy and Legendre Equation	K3
3	Solve Laplace Transforms of periodic functions and ODE using Inverse Laplace Transform	K3
4	Make use of the properties of analytic functions for verifying C-R equations for determination of Bilinear	K3
5	Develop the functions of two variables as Taylor's and Laurent's series and Contour integrals by using	K3

3.Course Code and Name : PH6251 - ENGINEERING PHYSICS II		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the basics, properties and applications of conducting materials	K2
2	Summarize the properties of semiconducting materials and semiconductor devices.	K2
3	Explain the basics, properties and applications of the magnetic materials and super conducting material	K2
4	Illustrate the concepts, mechanisms and applications of dielectric materials	K2
5	Outline the method of synthesis and explain the properties of Nano materials, SMA, Metallic glasses and	K2

4.Course Code and Name : CY6251 - ENGINEERING CHEMISTRY I		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the problems of using hard water in boilers and methods of treatment of water for boiler use	K2
2	Apply the design principles to electro chemical cell. Identify the types of corrosion and the methods of	K3

3	Illustrate the methods of harnessing energy from non-conventional energy sources	K2
4	Classify various engineering materials and explain their importance	K2
5	Relate the significance of solid, liquid and gaseous fuels. Explain the calorific values of fuels and air	K2

5.Course Code and Name : EC6201 Electronic Devices	
CO Statements	**Knowledge Level**

The students should be able to		
1	Describe the current voltage characteristics of semiconductor devices,	K2
2	Model the basic operations of Transistor	K3
3	Measure the Gain and Frequency response of Amplifier	K5
4	Develop the different power amplifier circuits, their design and use in electronics and communication circuits.	K2
5	Design the different oscillator circuits for various frequencies	K6

6.Course Code and Name : EE6201 - Circuit Theory	
CO Statements	**Knowledge Level**

The students should be able to		
1	Examine the electrical circuits	K4
2	Apply circuit theorems	K3
3	Analyze AC and DC Circuits	K4
4	Analyze coupled circuits and the transient response of circuits	K4
5	Analyze Phasor diagrams and analysis of three phase circuits	K4

7.Course Code and Name : GE6262 - Physics and Chemistry Laboratory - II	
CO Statements	**Knowledge Level**

The students should be able to		
1	Appraise the Young's modulus of the beam by uniform and non-uniform bending method, the moment of inetria and regidity modules for thin wire Torsion pendulum	K5
2	Make use Poiseuille's method for determining the coefficient of viscous city of the liquid	K3

3	Evaluate the refractive index of spectral lines for determining the dispersive power of a prism and the thickness of a thin wire through interference fringers using Air wedge apparatus.	K5
4	Determine the type, amount of alkalinity, hardness in a given water sample and evaluate the amount of copper	K5
5	Examine the potentiometric redox titration and conductometric precipitation titration	K4

8.Course Code and Name :EC6211 - Circuits and Devices Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Describe the characteristics of basic electronic devices	K2
2	Demonstrate the RL and RC circuits	K2
3	Demonstrate the Thevinin & Norton theorem	K2
4	Test for KVL & KCL, and Super Position Theorems	K4
5	Test for maximum power transfer & reciprocity theorems	K4

SEMESTER 03

1.Course Code and Name : MA6351 - Transforms and Partial Differential Equations		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Solve differential equations using Fourier series analysis for engineering applications.	K3
2	Utilize Dirichlet's condition for finding the Fourier series of a given function	K3
3	Apply Fourier series to solve one dimensional way, one and two dimensional heat equations.	K3
4	Solve Fourier transform for a given function and make use of them to evaluate certain definite Integrals	K3
5	Solve z transforms of standard functions and make use of use them to solve difference equations	K3

2.Course Code and Name : EE6352 - Electrical Engineering and Instrumentation		
	CO Statements	**Knowledge Level**
The students should be able to		

1	Expalin the three phase supply and power measurement	K2
2	Interpret the concepts in electrical generators, motors and transformers	K2
3	Demonstrate the basic measurement and instrumentation based devices.	K2
4	Summarize the digital instruments in measurements	K2
5	Exaplain the power generation, transmission and distribution concepts	K2

3.Course Code and Name : EC6301 - Object Oriented Programming and Data Structures		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the concepts of Object oriented programming.	K2
2	Develop a simple applications program using C++	K3
3	Discuss the different methods of organizing large amount of data	K6
4	Demonstrate the linear and non-linear data structures	K3
5	Develop a simple applications of linear and non-linear data structures	K2

4.Course Code and Name : EC6302 - Digital Electronics		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Demonstrate the concept of Boolean algebra and show the correlation between Boolean expressions	K2
2	Construct different methods used for simplification of Boolean expressions	K3
3	Interpret and implement Combinational circuits.	K2
4	Illustrate synchronous and asynchronous sequential circuits	K2
5	Develop a simple HDL codes for the circuits	K2

5.Course Code and Name : EC6303- Signals and Systems		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Make use of the properties of signals & systems	K3
2	Apply Laplace transform, Fourier transform, Z transform and DTFT in signal analysis	K3

3	Build the continuous time LTI systems using Fourier and Laplace Transforms	K3
4	Build discrete time LTI systems using Z transform and DTFT	K3
5	Apply the transforms in designing the systems	K3

6.Course Code and Name : EC6304 - Electronic Circuits-I	
CO Statements	**Knowledge Level**
The students should be able to	
1	Model the circuits with transistor biasing	K3
2	Construct simple amplifier circuits	K3
3	Construct the small signal equivalent circuits of transistors	K3
4	Model the amplifiers with active loads	K3
5	Develop large signal amplifiers	K3

7.Course Code and Name : EC6311- Analog and Digital Circuits Laboratory	
CO Statements	**Knowledge Level**
The students should be able to	
1	Distinguish cascade and cascade amplifier	K4
2	Analyze the limitation in bandwidth of single stage amplifier	K4
3	Analyze the limitation in bandwidth of multi stage amplifier	K4
4	Develop and Simulate amplifiers using Spice	K2
5	Measure CMRR in differential amplifier	K5

8.Course Code and Name : EC6312 - OOPS and Data Structures Laboratory	
CO Statements	**Knowledge Level**
The students should be able to	
1	Develop and implement C++ programs for manipulating stacks and queues	K2
2	Develop and implement C++ programs for manipulating linked lists, trees, and graphs	K2
3	Apply different data structures in programs	K3
4	Apply good programming design methods for program development.	K3

5	Apply the different data structures for implementing solutions to practical problems		K3

SEMESTER 04	

1.Course Code and Name : MA6451- Probability and Random Processes	

	CO Statements	Knowledge Level
The students should be able to		
1	Explain the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.	K2
2	Illustrate the basic concepts of one and two dimensional random variables and apply in engineering	K2
3	Apply the concept random processes in engineering disciplines.	K3
4	apply the concept of correlation and spectral densities.	K3
5	analyze the response of random inputs to linear time invariant systems.	K4

2.Course Code and Name : EC6401- Electronic Circuits II	

	CO Statements	Knowledge Level
The students should be able to		
1	Model the feedback amplifiers	K3
2	Illustrate about the frequency stability of Oscillators	K3
3	Analyze performance of tuned amplifiers	K4
4	Construct about Multivibrator Circuits	K3
5	Explain about the Wave Shaping and Blocking Oscillator	K2

3.Course Code and Name : EC6402 Communication Theory	

	CO Statements	Knowledge Level
The students should be able to		
1	Explain AM communication systems	K2

2	Construct an Angle modulated communication systems	K3
3	Apply the concepts of Random Process to the design of Communication systems	K3
4	Model the noise performance of AM and FM systems	K3
5	Explain the limits set by Information Theory	K2

4.Course Code and Name : EC6404 Linear Integrated Circuits		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Model linear and non linear applications of op – amps	K3
2	construct applications using analog multiplier and PLL	K3
3	Develop ADC and DAC using op – amps	K2
4	Develop waveforms using op – amp circuits	K2
5	Analyze special function ICs.	K4

5.Course Code and Name : EC6405 Control System Engineering		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Explain the elements of control system and their modeling using various Techniques	K2
2	Build time domain analysis of control systems required for stability analysis	K3
3	Build frequency domain analysis of control systems required for stability analysis	K3
4	Construct the compensation technique that can be used to stabilize control systems	K3
5	Find the state variable analysis methods	K1

6.Course Code and Name : EC6403 Electromagnetic Fields		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the basic mathematical concepts related to electromagnetic vector fields	K2
2	Explain the potential,energy density and their applications	K2
3	acquire the knowledge in magneto static fields, magnetic flux density, vector potential and its applications	K2

4	Distinguish the different methods of emf generation and Maxwell's equations	K4
5	Suimmarize the basic concepts electromagnetic waves and characterizing parameters	K2

7.Course Code and Name : EC6411 Circuit and Simulation Integrated Laboratory	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Analyze various types of feedback amplifiers	K4
2	Design and Analyze Oscillator and Tuned Amplifier	K6
3	Design and Analyze Wave-shaping circuits	K6
4	Model the different Multivibrator circuits	K3
5	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and	K6

8.Course Code and Name : EC6412 Linear Integrated Circuit Laboratory	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Design oscillators and amplifiers using operational amplifiers	K6
2	Design filters using Opamp and perform experiment on frequency response.	K6
3	Analyse the working of PLL and use PLL as frequency multiplier.	K4
4	Design DC power supply using ICs	K6
5	Analyse the performance of oscillators and multivibrators using SPICE	K4

9.Course Code and Name : EE6461 Electrical Engineering and Control System Laboratory	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Develop experiments to study the load characteristics of DC motors / generators	K2
2	Design bridge network circuit to measure the values of passive component	K6
3	Analyse the stability of linear system through simulation software.	K2
4	Develop experimens to transfer function of DC generators.	K3

5	Understand the behavior of linear system through simulation	K3

SEMESTER 05	

1.Course Code and Name : EC6501 Digital Communication	
CO Statements	**Knowledge Level**
The students should be able to	
1 Illustrate the principles of Sampling and Quantization.	K1
2 Explain base band transmission schemes	K2
3 Construct and implement band pass signaling schemes	K3
4 Analyze the spectral characteristics of band pass signaling schemes and their noise performance.	K4
5 Design an Error control coding scheme	K6

2.Course Code and Name : EC6502 Principles of Digital Signal Processing	
CO Statements	**Knowledge Level**
The students should be able to	
1 Interpret the transformation of discrete data between time and frequency domains and also apply mathematical tool for accelerating calculations in signal processing applications	K2
2 Construct IIR filtering for undesired signal and learn the frequency response characteristics of IIR filter	K3
3 Construct FIR filtering for undesired signal and know the linear phase response characteristics of FIR filter	K3
4 Classify the concept of quantization and also analyze how its affect in digital filters	K2
5 Explain various approach for changing the sampling rate of a digital signal is to convert it back into analog	K2

3.Course Code and Name : EC6503 Transmission Lines and Wave Guides	
CO Statements	**Knowledge Level**
The students should be able to	
1 Explain the propagation of signal through Transmission Lines	K2

2	Illustrate the concept of the design of high frequency transmission lines	K2
3	Construct high frequency components and systems with proper matching	K3
4	Construct and implement the different types of filters for high frequency application	K3
5	Analyze the propagation of waves in waveguides and resonators	K4

4.Course Code and Name : GE6351 Environmental Science and Engineering		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the concepts of an ecosystem , energy flow and conservation of biodiversity.	K2
2	Explain the causes, effects and control of various types of pollution.	K2
3	Outline the conservation of natural resources.	K2
4	Summarize the social issues of environment and legislative guidelines for disaster management.	K2
5	Relate population growth and its impact on environment and human health.	K2

5.Course Code and Name : EC6504 Microprocessor and Microcontroller		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Constuct ALP on 8086 microprocessor.	K2
2	Construct I/O circuits	K2
3	Develop Memory Interfacing circuits.	K3
4	Develop 8051 microcontroller based systems	K3
5	Explain the architecture and instruction set of ARM microcontroller	K2

6.Course Code and Name : EC6511 Digital Signal Processing Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop various types of continuous signal and discrete signal.	K3
2	Demonstrate their abilities towards DSP processor based implementation of DSP system.	K2

3	Analyze a continuous and discrete signals using FFT algorithm.	K4
4	Analyze Finite word length effect on DSP systems.	K4
5	Construct an adaptive filters for various applications of DSP.	K3

7.Course Code and Name : EC6512 Communication System Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Distinguish various modulation and demodulation techniques	K4
2	Analyze and demonstrate a good background in analyzing the block diagram of communication system.	K4
3	Illustrate how the mathematical concepts bend the analog communication process	K2
4	Construct with formulate the frequency modulation and angle modulation signals	K3
5	Interpret with differentiate types of transmitters and receivers used for particular application. system.	K3

8.Course Code and Name :EC6513 Microprocessor and Microcontroller Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop an ALP for fixed and Floating Point and Arithmetic	K6
2	Develop an ALP for Interface different I/Os with processor	K6
3	Develop an ALP to Generate waveforms using Microprocessors	K6
4	Develop an ALP using 8051 microcontroller	K6
5	Explain the difference between simulator and Emulator	K2

SEMESTER 06

1.Course Code and Name : MG6851 Principles of Management		
	CO Statements	**Knowledge Level**

	The students should be able to	
1	Illustrate the principle of managerial function planning and organizing	K2
2	Summarise the managerial function staffing and leading	K2
3	Illustrate the principle of managerial function directing	K2
4	Outline the managerial function controlling	K2
5	Interpret the knowledge on international aspect of management	K2

2.Course Code and Name : CS6303 Computer Architecture		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Model arithmetic and logic unit	K3
2	Construct and anlayse pipelined control units	K3
3	Evaluate performance of memory systems	K5
4	Illustrate parallel processing architectures	K2
5	Interpret the different ways of communication with I/O devices and standard I/O interfaces	K2

3.Course Code and Name : CS6551 Computer Networks		
	CO Statements	**Knowledge Level**
	The students should be able to	
1	Identify the components required to build different types of networks	K3
2	Choose the required functionality at each layer for given application	K1
3	Identify solution for each functionality at each layer	K3
4	Examine the flow of information from one node to another node in the network	K4
5	Apply the flow control and congestion control algorithms	K3

4.Course Code and Name : EC6601 VLSI Design		
	CO Statements	**Knowledge Level**
	The students should be able to	

1		Explain the basics of CMOS circuits and the CMOS process technology.	K2
2		Construct and analysis of combinational logic circuits.	K3
3		Develop and analysis of sequential logic circuits.	K3
4		Construct and realization of adder circuits and multipliers.	K3
5		Model and Implementation of Full custom and Semicustom ICs.	K3

5.Course Code and Name : EC6602 Antenna and Wave propagation		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the various types of antennas and wave propagation	K2
2	Analyze the antenna arrays, aperture antennas and special antennas such as frequency independent and broad	K4
3	Make use of the radio wave propagation in sky	K3
4	Evaluate the ionospheric and tropospheric wave propagation	K5
5	Identify the radiation pattern from a current element	K3

6.Course Code and Name : EC6001 Medical Electronics		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the various physiological parameters both electrical and non electrical parametres	K2
2	Explain the methods of recording and also the method of transmitting the parameters	K2
3	Discuss the application of electronics in diagnostic and therapeutic area.	K2
4	Measure biochemical and various physiological information	K5
5	Explain the working of units which will help to restore normal functioning	K2

7.Course Code and Name : EC6611 Computer Networks Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop a program to Communicate between two desktop computers	K2

2	Develop a program to Implement the different protocols	K2
3	Develop a program using sockets	K2
4	Develop a program to Implement and compare the various routing algorithms	K2
5	Develop a program for simulation tool.	K2

8.Course Code and Name : EC6612 VLSI Design Laboratory	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Develop the HDL code for basic as well as advanced digital integrated circuits.	K2
2	Develop the logic modules into FPGA Boards.	K2
3	Perform the Synthesization, Place and Route the digital IPs.	K2
4	Design, Simulate and Extract the layouts of Analog IC Blocks using EDA tools.	K6
5	Design and Simulate the modern chip manufacturing software tools.	K6

9.Course Code and Name : GE6674 Communication and Soft Skills - Laboratory Based	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Demonstrate reading and writing skills	K2
2	Develop listening and speaking skills	K3
3	Make use of acquired knowledge to take up international examination such as IELTS and TOEFL	K3
4	Apply the interview techniques for career development	K3
5	Illustrate the various aspects of soft skills	K2

SEMESTER 07

1.Course Code and Name : EC6004 Satellite Communication	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Analyze the Satellite orbits.	K4
2	Analyze the Space segment and Satellite link design	K4
3	Explain about Earth segment and System noise	K2
4	Tell about various Multiple Access Techniques	K1
5	Design various satellite applications	K6

2.Course Code and Name : EC6008 Web Technology	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Develop a basic idea about Java Fundamentals	K3
2	Relate about the fundamental Java networking technologies	K1
3	Design their own web services using the client concepts	K6
4	Design their own web services using the server concepts	K6
5	Explain the techniques involved to support real-time Software development	K2

3.Course Code and Name : EC6016 Opto Electronic Devices	
CO Statements	**Knowledge Level**
The students should be able to	

	CO Statements	Knowledge Level
1	Distinguish the solid state physics	K4
2	Model display devices	K3
3	Construct optoelectronic detection devices and modulators	K3
4	Constuct optoelectronic integrated circuits	K3

5	Analyze and choose the desired device for their applications	K4

4.Course Code and Name : EC6701 RF and Microwave Engineering		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Analyze the different low frequency parameters and S parameters and describe the RF component basics	K4
2	Analyze the amplifiers by means of stability, noise figures and study of various matching networks.	K4
3	Explain the operation of passive and active microwave devices	K2
4	Define about the working principle of various microwave tubes and the limitations of conventional tubes	K1
5	Compare the principle of operation of measuring instruments and various microwave measuring procedures	K2

5.Course Code and Name : EC6702 Optical Communication and Networks		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the basic elements of optical fiber transmission link and modes of configuration.	K2
2	Illustrate the various signal degradation factors associated with optical fiber	K2
3	Conclude the knowledge on optical sources and optical detectors	K5
4	Model transmitter and receiver of optical fiber sources.	K3
5	Analyze the digital transmission and its associated parameters on system performance	K4

6.Course Code and Name : EC6703 Embedded and Real Time Systems		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the embedded design process and also well know about architecture and programming of ARM	K2
2	Design and analysis for hardware and software computing platforms	K6
3	Create their basic kmowledge in real time operating system for designing various multirate systems	K6
4	Illustrate the various protocols for designing nettwork architecture for embedded design	K2
5	Design a embedded system for various real time applications using basic concepts of computing.	K6

7.Course Code and Name : EC6711 Embedded Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop an ALP in ARM for a specific Application using embedded-C	K6
2	Develop an ALP to Interface memory, A/D and D/A convertors with ARM system	K6
3	Analyze the performance of interrupt	K4
4	Develop an ALP for interfacing keyboard, display, motor and sensor.	K6
5	design a mini project using embedded system.	K6

8.Course Code and Name : EC6712 Optical and Microwave Laboratory		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Analyze the performance of simple optical link	K4
2	Test microwave components	K6
3	Analyse the mode characteristics of fiber	K4
4	Analyse the radiation of pattern of antenna	K4
5	Measure the various parameters of Numerical Aperture,Connector and Bending loss	K5

SEMESTER 08

1.Course Code and Name : EC6801 Wireless Communication		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Classify the characteristic of wireless channel	K2
2	Summarize the various cellular architectures	K2
3	Demonstrate the concepts behind various digital signaling schemes for fading channels	K2
4	Illustrate the various multipath mitigation techniques	K2

5	Model the various multiple antenna systems	K3

2.Course Code and Name : EC6802 Wireless Networks		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Contrast with the latest 3G/4G networks	K4
2	Illustrate the WiMAX networks and its architecture	K2
3	Apply wireless network environment for any application using latest wireless protocols and standards	K3
4	Distinguish applications for smart phones and mobile devices with latest network strategies	K4
5	Classify the evolution of 4G Networks, its architecture and applications	K2

3.Course Code and Name : GE6075 Professional Ethics in Engineering		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Illustrate the principles of human values	K2
2	Demonstrate the techniques and theories of Engineering Ethics	K2
3	Explain the procedure for Engineering As Social Experimentation	K2
4	Summarize the concept of Safety, Responsibilities And Rights	K2
5	Explain the different Global Issues	K2

4.Course Code and Name : GE6757 Total Quality Management		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Develop an understanding of quality management philosophies and Framework.	K3
2	Discuss the need of customer expectations, employee involvement and Supplier partnership.	K6
3	Analyze the TQM tools and Techniques to improve the product and process Quality.	K4
4	Apply modern tools to improve quality of the product.	K3
5	Explain an ISO 9001, Environmental Management Standards and ISO 14001 Certification process.	K2

5.Course Code and Name : EC6811 Project Work		
	CO Statements	**Knowledge Level**
The students should be able to		
1	Demonstrate a sound technical knowledge of their selected project topic.	K2
2	Estimate the problem identification, formulation and solution.	K6
3	Design engineering solutions to complex problems and Conduct an engineering project	K6
4	Construct a group Communicate with engineers and the community at large in written an oral forms.	K6
5	Demonstrate the knowledge, skills and attitudes of a professional engineer.	K2