CourseName : Complex Variable and Transforms(20MA1005)

20MA1005	Complex Variable and Transforms
CO1	Apply the techniques of special functions in various engineering problems . (BL-3)
CO2	Identify the analyticity of complex functions to find the derivatives of complex functions. (BL-2)
CO3	Apply Cauchy‘s integral formula and Cauchy‘s integral theorem to evaluate improper integrals
CO4	Solve the Algebraic ,Transcendental Equations by using numerical methods & understand the
CO5	Solve the ordinary differential equations by using various numerical methods. (BL-3)

CourseName: DATA STRUCTURES (20ES1010)

20ES1010	DATA STRUCTURES
CO1	Classify the Data Structures concepts in real time applications. (BL-2).
CO2	Demonstrate the concepts of stacks and queues for organizing data. (BL-3).
CO3	Demonstrate the concepts of Linked Lists in Linear Data Structures. (BL-3).
CO4	Interpret different ways of handling Trees and Graphs as non-linear Data Structures (BL-3).
CO5	Analyze different searching and sorting techniques for organizing data (BL-4).

CourseName:ELECTRONIC DEVICES AND CIRCUITS(20ES1012)

20ES1012	ELECTRONIC DEVICES AND CIRCUITS
CO1	**Illustrate** theV-I characteristics of P-N junction Diode and special semiconductor **devices**. (BL-2)
CO2	**Demonstrate** the performance of rectifiers with and without filters. (BL-2)
CO3	**Compare** the operating characteristics of BJT (BL-3)
CO4	**Analyze** the BJT biasing techniques. (BL-4)
CO5	**Interpret** the characteristics of MOSFET. (BL-2)

CourseName: DIGITAL LOGIC DESIGN (20EC2001)

20EC2001	DIGITAL LOGIC DESIGN
CO1	**Use** number systems, binary codes and Boolean algebra to implement digital circuits **(BL-3)**
CO2	**Apply** minimization techniques on Boolean expressions. **(BL-3)**
CO3	**Design** combinational circuits using logic gates. **(BL-3)**
CO4	**Analyze** synchronous sequential circuits. **(BL-4)**
CO5	**Classify**the memories and programmable logic devices. **(BL-2)**

CourseName: Network Theory(20EC2002)

20EC2002	Network Theory
CO1	Describe the Series resonance ,parallel resonance and analyze the locus diagrams of R,L,C[BL:2]
CO2	Analyze the DC transients of R,L,C [BL:3]
CO3	Analyze the AC transients of R,L,C [BL:3]
CO4	Derive Two port networks of Electrical circuits[BL:2]
CO5	Analyze the Filters and Network functions(BL-4)

CourseName: ELECTRONIC DEVICES LAB (20ES1515)

20ES1515	ELECTRONIC DEVICES LAB
CO1	Demonstrate the basic characteristics and applications of basic electronic devices. **(BL-02)**
CO2	Draw the characteristics of electronic devices by plotting graphs**(BL-02)**
CO3	Analyze the Characteristics of UJT, BJT, FET, and SCR **(BL-04).**
CO4	Design FET based amplifier circuits/BJT based amplifiers for the given specifications**.(BL-03)**

CourseName: Digital Logic Design Lab (20EC2501)

20EC2501	Digital Logic Design Lab
CO1	Demonstrate the truth table of various expressions and combinational circuits using logic gates. **(BL-2)**
CO2	Develop various combinational circuits such as adders, sub-tractors, comparators, multiplexers
CO3	Construct flips-flops, counters and shift registers. **(BL-3)**
CO4	Simulate full adder and up/down counters. **(BL-3)**

CourseName: Network theory lab(20EC2502)

20EC2502	Network theory lab
CO1	**Demonstrate** the concept of **resonance and locus diagrams** of R,L,C**.(BL-2)**
CO2	**Analyze** the **transient response** of AC and DC circuits.**(BL-3)**
CO3	**Determine** experimentally the **two port network parameters and filters** and verify their result.**(BL-2).**

CourseName: ANALOG ELECTRONICS (20EC2003)

20EC2003	ANALOG ELECTRONICS
CO1	Analyze the small signal amplifiers at low frequencies and high frequencies.(BL-4)
CO2	Illustrate the concepts of negative feedback amplifiers. (BL-2)
CO3	Illustrate the working principle of oscillators. (BL-2)
CO4	Analyze the parameters of multi stage amplifiers.(BL-4)
CO5	Interpret the concepts of Power amplifiers and Tuned amplifiers(BL-2)

CourseName: Control system (20EC2004)

20EC2004	Control system
CO1	Analyze the differential equations for mechanical and electrical systems and obtain the transfer
CO2	Analyze the time domain specifications, steady state errors and to learn time response analysis of first
CO3	Summarize the concepts Routh's stability and Root locus to find the stability of the system (BL - 2)
CO4	Summarize the frequency domain specifications from Bode, Polar, Nyquist plots and evaluate the
CO5	Summarize the concept of state space analysis, controllability and Observability and to obtain the

CourseName: ELECTROMAGNETIC WAVES AND TRANSMISSION LINES (20EC2005)

20EC2005	ELECTROMAGNETIC WAVES AND TRANSMISSION LINES
CO1	Apply the Coulomb's law and Gauss law to different charge distributions.(BL-3)
CO2	Make use of Biot-Savart Law, Ampere's Circuit law to static current distributions.(BL-3)
CO3	Analyze the electric and magnetic fields.(BL-4)
CO4	Interpret the characteristics of EM Wave.(BL-2)
CO5	Illustrate the concepts of transmission lines.(BL-2)

CourseName: PROBABILITY THEORY AND RANDOM PROCESS (20EC2006)

20EC2006	PROBABILITY THEORY AND RANDOM PROCESS
CO1	Interpret the concepts of sample spaces and set theory to calculate probabilities (BL-2)
CO2	Apply the concept of random variables with probability density and distribution functions to compute probabilities for complex problems. (BL-3)
CO3	Compute the statistical averages for multiple random variables using joint probability density and distribution functions. (BL-2)
CO4	Interpret the concept of Power Spectrum Density & Cross Power Spectrum density related to temporal characteristics and spectral characteristics (BL-4)
CO5	Apply the principles of a random process for solving system related problems. (BL-3)

CourseName: Signals and Systems (20EC2007)

20EC2007	Signals and Systems
CO1	**Interpret** the concept of various signals and linear Time invariant Systems. (BL-2)
CO2	**Interpret** the concept of Fourier series for Continuous time signals.(BL-2)
CO3	**Apply** continuous timeFourier Transform for Continuous time signals **.**(BL-3)
CO4	**Apply** Sampling Theorem for Continuous time signals.(BL-3)
CO5	**Analyze** Laplace and Z-transform for continuous and discrete time systems.(BL-4)

CourseName: ANALOG ELECTRONICS LAB (20EC2503)

20EC2503	ANALOG ELECTRONICS LAB
CO1	Measure various parameters of analog circuits and compare experimental results in the laboratory with theoretical analysis. **(BL-3)**
CO2	Analyze negative feedback amplifier circuits, oscillators, Power amplifiers, Tuned amplifiers **(BL-4)**
CO3	Design analog electronic circuits using discrete components **(BL-3)**
CO4	Design RC and LC oscillators, Feedback amplifier for specified gain and multistage amplifiers for Low, Mid and high frequencies. **(BL-3)**

CourseName: ANALOG AND DIGITAL COMMUNICATION SYSTEMS (20EC2008)

20EC2008	ANALOG AND DIGITAL COMMUNICATION SYSTEMS
CO1	Define the need of modulation for communication systems. (BL:1)
CO2	Verify the effect of noise on the performance of communication system BL2
CO3	Analyze the various Digital modulation techniques BL4
CO4	Calculate the bit error rate for different digital modulation schemes BL4
CO5	Make use of the different error control codes for efficient transmission BL3

CourseName: Linear IC Applications (20EC2009)

20EC2009	Linear IC Applications
CO1	**Analyze** the various characteristics **of Differential amplifier**.(**BL: 4**).
CO2	**Interpret** the characteristics and configurations of Op-amp (**BL: 2**).
CO3	**Analyze**the linear and nonlinear **applications** of an Op-amp (**BL:2**)
CO4	**Design** the Oscillators and active filters using Op-amp (**BL: 4**).
CO5	**Study** the applications ofthe special purpose integrated circuits and Data Convertors. (**BL:2**).

CourseName: MICROPROCESSORS AND MICROCONTROLLERS (20EC2010)

20EC2010	MICROPROCESSORS AND MICROCONTROLLERS
CO1	Demonstrate the internal architecture, memory organisation and interrupt structure of 8086 microprocessor.**(BL-2)**
CO2	Construction of a maintainable assembly language program for an algorithm. **(BL-3)**
CO3	Interpret the concepts of low power modes of MSP 430.**(BL-2)**
CO4	Develop programs using software interrupts and addressing modes of MSP430.**(BL-3)**
CO5	Compare various on chip peripherals of MAP 430.**(BL-3)**

CourseName: ANALOG AND DIGITAL COMMUNICATIONS LAB (20EC2505)

20EC2505	ANALOG AND DIGITAL COMMUNICATIONS LAB
CO1	Demonstrate analog& pulse modulation and demodulation schemes. [BL:3]
CO2	Analyze the behaviour of digital modulation and demodulation techniques. [BL:4]
CO3	Execute programs in MATLAB to implement various digital carrier keying techniques.[BL:3]
CO4	Simulate channel coding and equalization techniques using MATLAB [BL:2]

CourseName: MICROPROCESSORS &MICROCONTROLLERS LAB (20EC2506)

20EC2506	MICROPROCESSORS &MICROCONTROLLERS LAB
CO1	Understand the installation process of CC studio & launch pad. **(BL-2)**
CO2	Synthesize operations on MSP430 microcontroller using Code Composer Studio. **(BL-3)**
CO3	Examine power consumption of microcontroller using low power modes. **(BL-3)**

CourseName: Digital Design using HDL (20EC2011)

20EC2011	Digital Design using HDL
CO1	Interpret digital design flow used in chip design Flow. (BL-2)
CO2	Model simple digital circuits using Verilog HDL. (BL-3)
CO3	Simulate digital circuits using Verilog HDL.(BL-3)
CO4	Analyze simulation techniques in behavioral and Switch level models of digital circuits. (BL-3)
CO5	Model digital circuits using Verilog tasks and directives.(BL-3)

CourseName: Digital Signal Processing (20EC2012)

20EC2012	Digital Signal Processing
CO1	**Illustrate** the concepts of digital signal processing techniques. **(BL-02)**
CO2	**Analyze** time and frequency domains description of discrete time signals using FFT
CO3	**Design** of IIR filters using different methods**(BL-04)**
CO4	**Design** of FIR filters using different methods **(BL-04)**
CO5	**Summarize**the architectural features of programmable DSP Processor. **(BL-02)**

CourseName: VLSI DESIGN (20EC2013)

20EC2013	VLSI DESIGN
CO1	Analyze the MOS Device Equations & CMOS basic inverter characteristics. (BL-4).
CO2	Apply the concepts of stick diagrams and layout design rules for CMOS Circuits. (BL-3).
CO3	Design the digital complex logic gate design of various types using CMOS and other forms of logic. (BL-3).
CO4	Develop various Data Path subsystems, parity generators, and array of memories to compensate trade-off area, speed and power requirements. (BL-3).
CO5	Implement digital logic circuits using PLAs, FPGAs and CPLDs. (BL-4).

CourseName: DIGITAL SIGNAL PROCESSING LAB (20EC2507)

20EC2507	DIGITAL SIGNAL PROCESSING LAB
CO1	Analyze discrete time signals & systems using MATLAB
CO2	Design & implement IIR & FIR filters for different specifications
CO3	Design DSP based real time processing systems to meet desired needs of the society

CourseName: IC Applications Laboratory(20EC2508)

20EC2508	IC Applications Laboratory
CO1	Illustrate the working of Op amp ICs & Application specific analog ICs.
CO2	Analyze operational amplifier based circuits for linear and non-linear applications.
CO3	Design Operational amplifiers for linear and nonlinear application, Multivibrator circuits using 555 & application specific ICs.
CO4	Simulate all linear and nonlinear application based Op amp Circuits and circuits based on application specific ICs.

CourseName: VLSI DESIGN LAB (20EC2509)

20EC2509	VLSI DESIGN LAB
CO1	Develop Verilog HDL source code for the given problem/experiment, and simulate the given circuit with suitable simulator and verify the results.
CO2	Analyze the obtained results of the given experiment/problem.
CO3	Implement the experiments using FPGA/CPLD hardware tools.