



MANGALORE INSTITUTE OF TECHNOLOGY ANENGINEERING
(An ISO 9001:2008 Certified Institution)
Department of Electronics and Communication Engineering

2010 SCHEME

Course Title : Engineering Mathematics -III

Course Code : 10MAT31

Course Index : C201

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C201.1	Know the use of periodic signals and Fourier series to analyze circuits and explain the general linear system theory for continuous-time signals and systems using the Fourier transform. Use the analytical method to find the solution of partial differential equations.
C201.2	Apply numerical methods to solve algebraic and transcendental equations.
C201.3	Construct linear programming model to get optimum results in industries. Analyze discrete-time systems using convolution and z-transform.
C201.4	Apply numerical methods to compute a definite integral and find the solution of partial differential equations in the models involving oscillation, waves fluid mechanics, electromagnetism and heat transfer.

Course Title : Analog Electronic Circuits

Course Code : 10ES32

Course Index : C202

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C202.1	Acquire basic knowledge on the working of diode circuits and Transistor biasing.
C202.2	Design amplifier circuits using BJT s And FET's and observe the amplitude and frequency responses of common amplifier circuits.
C202.3	Acquire knowledge about feedback amplifier and their characteristics. Know about different power amplifier circuits, their design and use in electronics and communication circuits.
C202.4	Apply concept of BJT operation in the design of Oscillator circuits and Develop the ability to understand the design and working of FET amplifiers

Course Title : Logic Design

Course Code : 10ES33

Course Index : C203

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C203.1	Develop a simplified switching equation using Karnaugh Maps and Quine-McClusky techniques.
C203.2	Design combinational circuits by understanding the operation of Decoders, Encoders, Multiplexers, Adders, Subtractors and Comparators.
C203.3	Understand the Latches, SR, JK, T AND D Flipflops: Basic building block of sequential circuits. Design Synchronous/Asynchronous Counters and Shift registers using Flip Flops.
C203.4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits.

Course Title : Network Theory

Course Code : 10ES34

Course Index : C204

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C204.1	Understand the fundamental concepts of control systems, mathematical modelling of the system and optimization of the control systems using Block diagram reduction and signal flow graphs.
C204.2	Understand transient response and time domain specification of a system and also applying Routh-Hurwitz criterion to determine the domain of stability of linear time-invariant systems in the parameter space.
C204.3	Evaluate stability of the system in by constructing root locus in time domain analysis, to analyse system in frequency domain and to evaluate the stability of the system using Bode plots in frequency domain.
C204.4	Analyse the stability of the system using Nyquist criterion in frequency domain and also to understand the representation of a system in the form of state space variables.

Course Title : Electronic Instrumentation

Course Code : 10IT35

Course Index : C205

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C205.1	Identify the errors associated with measuring instruments and analyze the operation of digital voltmeters based on V-T, V-F and Successive approximation.
C205.2	Describe operating principles of oscilloscopes such as Delayed time-base oscilloscopes, Analog storage, and Digital storage oscilloscopes
C205.3	Analyze the operation of signal generators with fixed/variable AF oscillator, function generator and AC/DC Bridges in measurement of passive parameters.
C205.4	Describe functional concepts of passive and active transducers, Display devices and Bolometer.

Course Title : Field Theory

Course Code : 10ES36

Course Index : C206

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C206.1	Understand the different coordinate systems, application of Coulomb's law and Evaluate the electric field due to 1-Dimensional charges and Gauss's Law Maxwell's equation in differential and integral form.
C206.2	Apply the Laplace equations for different coordinate systems, and to evaluate Biot-Savart law, Ampere's circuital law & Stokes' theorem
C206.3	Evaluate the force experienced by a charge in magnetic field and to infer the effects of magnetic forces in the medium as well as on the boundary and to apply and evaluate Maxwell's Equations in point an integral form
C206.4	Evaluate power associated with Electromagnetic waves by the application of Poynting's theorem and to analyse wave propagation in general directions.

Course Title : Analog Electronics Lab

Course Code : 10ESL37

Course Index : C207

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C207.1	Use the Discrete components to test the DC circuits to compare experimental results in the laboratory with theoretical analysis.
C207.2	Design, Test and evaluate BJT and FET amplifiers and oscillators to compare experimental results in the laboratory with theoretical analysis.
C207.3	Design and Test rectifiers & Clampers to compare experimental results in the laboratory with theoretical analysis.

Course Title : Logic Design Lab

Course Code : 10ESL38

Course Index : C208

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C208.1	Simplify and Realize the given Boolean expression using logic gates and verify the same using truth table.
C208.2	Design and test adders, subtractors, code converters, comparators, multiplexers, priority encoders and decoders.
C208.3	Construct flips-flops and Design synchronous and asynchronous counters, shift registers.
C208.4	Design and test sequence generator using shift register IC.

Course Title : Engineering Mathematics -IV

Course Code : 10MAT41

Course Index : C209

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C209.1	Apply appropriate single step and multi step numerical methods to solve first and second order ordinary differential equations arising in flow data design problems.
C209.2	Make use of Bessel's and Legendre's function which often arises when a problem possess axial and spherical symmetry, such as in quantum mechanics ,electromagnetic theory, hydrodynamics and heat conduction and apply different sampling theory in real situations and evaluate the quantity of the sample in the research.

C209.3	State and prove Cauchy's theorem and its consequences including Cauchy's integral formula and solve two dimensional potential problems using analytic functions in the study of heat flow, fluid mechanics and electrostatics.
C209.4	Analyze and interpret the data that involves uncertainty arising in digital signal processing, optimization concepts of stability of design and structural engineering.

Course Title : Microcontrollers

Course Code : 10ES42

Course Index : C210

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C210.1	Describe the architectural features of 8051 microcontrollers, memory organisation, addressing modes, and Instruction set and to write assembly programs.
C210.2	Understand the concept of assembler directives, Assembly programs, delay calculations and to write programs to interface peripheral/ I/O devices.
C210.3	Apply the knowledge of Subroutines and Interrupts in writing assembly/ C programs for timer and serial programming and to study 8255 PPI.
C210.4	Describe the architecture of MSP 430, code composer studio and to understand the interfacing of LED, LCD, RTC to MSP 430.

Course Title : Control Systems

Course Code : 10ES43

Course Index : C211

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C211.1	Understand the fundamental concepts of control systems, mathematical modelling of the system and optimization of the control systems using Block diagram reduction and signal flow graphs.
C211.2	Understand transient response and time domain specification of a system and also applying Routh-Hurwitz criterion to determine the domain of stability of linear time-invariant systems in the parameter space.
C211.3	Evaluate stability of the system by constructing root locus in time domain analysis, to analyse systems in frequency domain and to evaluate the stability of the system using Bode plots in frequency domain.
C211.4	Analyse the stability of the system using Nyquist criterion in frequency domain and also to understand the representation of a system in the form of state space variables.

Course Title : Signals and Systems

Course Code : 10EC44

Course Index : C212

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C212.1	Understand the classification and mathematical description of continuous/discrete time signals. Also, to derive the equation describing the relationship between input and output of continuous Time and discrete time systems.
C212.2	Classify the systems based on their properties and represent the Linear Time Invariant (LTI) systems using impulse response. Also, to Classify the LTI systems based on their properties and represent the periodic signals in frequency domain using Fourier Series.
C212.3	Represent the aperiodic signals in frequency domain using Fourier Transform and its properties with certain applications.
C212.4	Compute Z-transforms, inverse Z- transforms and analyze the transfer functions of LTI systems in Z-domain.

Course Title : Fundamentals of HDL

Course Code : 10EC45

Course Index : C213

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C213.1	Understand the structure of HDL, Types of description styles, simulation and synthesis, distinguish between VHDL and Verilog.Design and implement digital circuit in data flow description using VHDL and Verilog.
C213.2	Design and implement digital circuit in behavioural and structural description using VHDL and Verilog code.
C213.3	Distinguish between procedures, tasks and functions. Understand the concepts of file processing, mixed type description, VHDL packages.
C213.4	Describe the procedure to invoke one language from the other. Understand the concepts of synthesis and Interpret the various constructs in logic synthesis.

Course Title : Linear IC's and Applications

Course Code : 10EC46

Course Index : C214

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C214.1	Understand basic building blocks of op-amp, op-amp parameters and design of basic amplifier circuit applications and various types of capacitor coupled op-amp circuits.
C214.2	Analyze the stability issues of op-amp circuits, op-amp frequency response and design various op-amp applications such as voltage /current sources, instrumentation amplifier, precision rectifier, limiting circuits.
C214.3	Understand the operation and design of signal generating circuits, V to I and I to V converters, oscillator circuits, first order and second order active low/high pass filter circuits using op-amp.
C214.4	Understand the basics of a voltage regulator, different types of voltage regulator designs, basic internal structure of 555 timer IC and further apply it to design multi vibrators, Schmitt trigger, A/D and D/A converters.

Course Title : Microcontrollers LAB

Course Code : 10ESL47

Course Index : C215

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C215.1	Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051.
C215.2	Interface different input and output devices to 8051 and control them using Assembly language and C programs.
C215.3	Interface different input and output devices to MSP 430 and control them using Assembly language and C programs.

Course Title : HDL Lab

Course Code : 10ECL48

Course Index : C216

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C216.1	Write the Verilog/VHDL programs to simulate Combinational Circuits in Dataflow, Behavioral and Gate Level Abstractions.
C216.2	Describe sequential circuits like flip flops and counters in Verilog/VHDL and obtain simulation waveforms.

C216.3	Synthesize Combinational and Sequential circuits on Programmable IC's and test the functionality on hardware.
C216.4	Interface the hardware to the programmable chips and obtain the required output.

Course Title : Management & Entrepreneurship

Course Code : 10AL51

Course Index : C301

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C301.1	Understand the meaning and scope of management and to know the development of management thoughts and analyse the objectives of planning process and the importance of decision making of planning.
C301.2	Understand the Principles of organization, Committees – Centralization Vs Decentralization, the process of selection and recruitment in staffing Leadership styles and Motivation Theories.
C301.3	Understand the meaning and function of Entrepreneur, the role of Entrepreneur in the economical development. Analyse need, scope and role SSI towards economical development and available government fund.
C301.4	Understand institutional support and to know the procedures to apply them for the Preparation of project report and the feasibility analysis.

Course Title : Digital Signal Processing

Course Code : 10EC52

Course Index : C302

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C302.1	Compute Discrete Fourier Transform(DFT)/Inverse DFT of discrete sequence using the definition and properties of DFT.
C302.2	Develop Fast Fourier Transform(FFT) algorithms to reduce the computation time of DFT.
C302.3	Design and analyze analog/digital Infinite Impulse Response (IIR) filters using Butterworth/Chebyshev approximations.
C302.4	Design Finite Impulse Response (FIR) filters using Windows/Frequency sampling techniques and realize FIR/IIR filters using Direct form, cascade, parallel and Lattice structures.

Course Title : Analog Communication

Course Code : 10EC53

Course Index : C303

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C303.1	Apply the concepts of random and Gaussian process in communication systems and understand the generation and detection of amplitude modulation, DSB-SC.
C303.2	Distinguish the methods of generating and demodulating SSB , VSB and time domain, frequency domain analysis
C303.3	Interpret the principles, generation, reconstruction and applications of frequency modulation.
C303.4	Identify the types of noise that are encountered in communication systems and Analyze the performance of AM and FM systems in the presence of noise.

Course Title : Microwaves and Radar

Course Code : 10EC54

Course Index : C304

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C304.1	Understand the basic concepts of wave propagation in transmission lines, waveguides, microwave components and analyze microwave transmission lines parameters using smith chart.
C304.2	Describe the operations of microwave diodes and analyze microwave network theory using network parameters
C304.3	Design and analyze the microwave strip lines and microwave passive devices.
C304.4	Describe the RADAR fundamentals, working principles of MTI, pulse Doppler RADAR and solve problems based on ranging & detection.

Course Title : Information Theory and Coding

Course Code : 10EC55

Course Index : C305

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C305.1	Calculate entropy, efficiency of dependent and independent sources, to analyze the performance of Shannon encoding algorithm, Shannon Fano encoding algorithm, Huffman coding .

C305.2	Measure mutual information, channel capacity, entropy of discrete and continuous channels based on channel parameters.
C305.3	Design encoding, decoding procedure for linear block codes, cyclic codes.
C305.4	Design encoding procedure for convolutional code in time domain and transform domain approach for convolutional codes.

Course Title : Fundamentals of CMOS VLSI

Course Code : 10EC56

Course Index : C306

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C306.1	Describe the trends in semiconductor technology, Basics of MOSFET and Fabrication steps of MOS Transistors.
C306.2	Design Layout, Stick diagrams, different logic circuits using different logic styles.
C306.3	Analyse and design CMOS Subsystems and describe memory elements, Registers and clock.
C306.4	Describe scaling of MOS circuits and Testing VLSI circuits.

Course Title : DSP Lab

Course Code : 10ECL57

Course Index : C307

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C307.1	Determine the sampling frequency required for a multispectral signal and to solve given difference equation with impulse response of the system.
C307.2	Perform convolution, correlation of two given sequences. Further, verify the properties of the convolution and correlation.
C307.3	Obtain the transform domain representation of a sequence using the DFT. Plot the magnitude and phase spectrum.
C307.4	Design the FIR and IIR filter for the given specifications.

Course Title : Analog Communication lab+LIC lab

Course Code : 10ECL58

Course Index : C308

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C308.1	Design and test the working of Second order filters, Comparators and signal Conditioning Circuits.

C308.2	Design of Multivibrator, R-2R ladder and frequency synthesis using PLL.
C308.3	Design of Amplitude Modulation and Intermediate frequency Modulation.
C308.4	Design of Precision rectifiers, FM and PWM schemes

Course Title : Digital Communication

Course Code : 10EC61

Course Index : C309

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C309.1	Illustrate the process of sampling, signal operations and reconstruction.
C309.2	Describe the process of waveform coding, SNR and quantization with step size variation.
C309.3	Analyze Base band transmission and interpret the best time for transmission with minimal transmission errors.
C309.4	Describe the process of Digital Modulation and Demodulation schemes by using orthogonal process to recover the signals.
C309.5	Analyze the process of 'detection and estimation' of signals and Spread spectrum communication.

Course Title : Microprocessor

Course Code : 10EC62

Course Index : C310

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C310.1	Describe the 8086 architecture, addressing modes, instruction set pertaining arithmetic & logical, looping & branching operations and illustrate using assembly language programming.
C310.2	Interpret the usage of assembler directives, Operators, String instructions, interrupts, procedures and macros in assembly language programs.
C310.3	Demonstrate the interfacing of 4x4 keyboard, stepper motor and alphanumeric display with 8086 microprocessor using 8255 PPI.
C310.4	Describe the characteristics of peripheral component interconnect bus, the parallel printer interface, the universal serial bus, minimum and maximum modes of operation of 8086 microprocessor.
C310.5	Describe the need for advanced microprocessors, architecture of higher end microprocessors such as 80386, 80486.

Course Title : Microelectronics Circuits

Course Code : 10EC63

Course Index : C311

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C311.1	Understand the basic circuit models of MOSFET devices and its applications.
C311.2	Analyze and design single stage IC amplifiers with and without active load.
C311.3	Analyze and design multistage IC amplifiers with and without active load.
C311.4	Understand the applications of negative feedback and applying to various topologies of amplifiers
C311.5	Evaluate practical circuit applications of operational amplifier using IC 741.
C311.6	Apply physical basics of CMOS inverter in the basic design of IC system.

Course Title : Antenna and Propagation

Course Code : 10EC64

Course Index : C312

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C312.1	Understand and apply the parameters of antenna to determine directivity of radiation patterns in terms of beam width.
C312.2	Analyze isotropic point sources in an array system and design an array antenna for N isotropic sources.
C312.3	Derive the expression for radiation patterns of various antenna.
C312.4	Distinguish the antennas (Wire, Aperture, Array and Patch Antennas) according to the applications.
C312.5	Explore the concepts of various radio propagations and calculate various parameters.

Course Title : Operating Systems

Course Code : 10EC65

Course Index : C313

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C313.1	Compare the classes of OS by interpreting the goals, objectives of OS, resource allocation and its related functions.
C313.2	Distinguish between the principle of monolithic, layered kernel and micro kernel OS by understanding the structure & operation of OS.
C313.3	Differentiate between processes and threads. Illustrate the principle of contiguous and non-contiguous memory allocation.
C313.4	Describe the interface of file system with Input- Output Control Subsystem

	(IOCS) and implementation of virtual memory.
C313.5	Evaluate the performance of pre-emptive and non-preemptive scheduling policies.
C313.6	Describe message passing and Concept of mailbox.

Course Title : Programming with C++

Course Code : 10EC665

Course Index : C314

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C314.1	Understanding the basic concepts of Object oriented design and object based design.
C314.2	Explain the basic concepts of C++ language.
C314.3	Understanding the usage if operators, branching and looping statements and modular programming with functions.
C314.4	Understanding the basic features of OOP's – classes and objects.
C314.5	Understanding the concept of exception handling, polymorphism and dynamic memory allocation.
C314.6	Understanding the concepts of inheritance.

Course Title : Advanced Communication Lab

Course Code : 10ECL67

Course Index : C315

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C315.1	Design and test the digital modulation, Multiplexing circuits/systems and display the waveforms.
C315.2	Demonstrate the coded Digital modulation schemes for effective transmission with the display of waveforms.
C315.3	Determine the characteristics and response of optical fiber communication links and microwave parameters.
C315.4	Determine the characteristics of microstrip line antennas and devices and compute the parameters associated with it.

Course Title : Microprocessor Lab

Course Code : 10ECL68

Course Index : C316

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C316.1	Program 8086 Microprocessor to perform arithmetic, logical and data transfer operations.
C316.2	Apply Assembler directives, DOS interrupts, and branch and loop instructions.
C316.3	Apply the concept of Procedures and Macros for modular programming and use of String Instructions.
C316.4	Interface peripheral devices through PIO 8255 to 8086 Microprocessor for Simple Applications.

Course Title : Computer Communication Networks

Course Code : 10EC71

Course Index : C401

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C401.1	Understand the layers of OSI reference Model and Compare the strengths and weaknesses of protocols for noisy and noiseless channels.
C401.2	Identify accessing methods, types of local area networks and standards
C401.3	Classify the types of Network Devices and their Functionalities, clear knowledge about internet protocols.
C401.4	Analyze routing protocols and transport layer protocols.

Course Title : Optical Fiber Communication

Course Code : 10EC72

Course Index : C402

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C402.1	Describe the various blocks of OFC systems, optical networks amplifiers with ray theory, Distinguish between attenuation, absorption and scattering in optical fibers.
C402.2	Understand construction and behavior of LED and LASER diode of optical transmitter and photodiodes in receiver in OFC.
C402.3	Distinguish fiber alignment and joint loss and analyze the behaviour of optical receiver.
C402.4	Analyze the performance of analog and digital links of OFC systems with their parameters.

C402.5	Describe the WDM system with optical networks using active and passive components.
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Course Title : Power Electronics

Course Code : 10EC73

Course Index : C403

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C403.1	Interpret the basic operation and characteristics of power semiconductor devices and working principles of power transistors.
C403.2	Analyze the working principle of thyristor and rectifier circuits using thyristors.
C403.3	Apply the knowledge of thyristor characteristics in analyzing thyristor commutation circuits and AC voltage controllers
C403.4	Analyze the operation of DC chopper circuits and Inverters using thyristors.

Course Title : Embedded System Design

Course Code : 10EC74

Course Index : C404

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C404.1	Describe the hardware and software components of an embedded system design and explain the concepts of finite state machines.
C404.2	Describe read and write operation of SRAM/DRAM ,memory subsystem architecture and explain the design and development of embedded system illustrating the design of counter
C404.3	Describe operating system architecture, scheduling strategy in an operating system with reference to CPU resource allocation, memory resource management & Task Control Blocks.
C404.4	Analyse Amdahls law for performance improvement /optimization for embedded design, and understand the significance of memory loading, hardware accelerator for improving system performance

Course Title : DSP Algorithms and Architecture

Course Code : 10EC751

Course Index : C405

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C405.1	Understand and apply the basic concepts, techniques of DSP.

C405.2	Interpret the details of basic building blocks of programmable Digital Signal Processor and addressing modes of TMS320C54XX DSP Processors.
C405.3	Illustrate the addressing modes, instruction set, interrupts, pipeline operations and analyze the basic DSP algorithms, programs for TMS320C54XX DSP Processors.
C405.4	Explain the interfacing of memory, I/O peripherals to DSP devices and applications of DSP processors in CODEC interface, biotelemetry receiver, speech and image processing.

Course Title : Image Processing

Course Code : 10EC763

Course Index : C406

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C406.1	Understand the fundamentals concepts of a Digital Image Processing system
C406.2	Analyze image in the frequency domain using various Transforms.
C406.3	Evaluate the spatial domain and frequency domain techniques for image enhancement.
C406.4	Identify model of image Degradation and Restoration process & Describe color fundamentals of an image.

Course Title : VLSI Lab

Course Code : 10ECL77

Course Index : C407

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C407.1	Design verilog module & Develop test bench to Simulate Logic Gates.
C407.2	Design verilog module & Develop test bench to Simulate sequential circuits.
C407.3	Design CMOS inverter, Common Source, Common Drain and Differential Amplifiers and Analyze the DC, ac and Transient Characteristics. Create Layout for designed amplifiers to verify DRC, LVS.
C407.4	Design Operational Amplifier and R2R based Digital to Analog Converter using Library Components to Analyze DC, ac and Transient Characteristics.

Course Title : Power Electronics Lab

Course Code : 10ECL78

Course Index : C408

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C408.1	Test the operation of SCR, DIAC, MOSFET, IGBT and to plot the static characteristic.
C408.2	Design controlled rectifiers using RC, UJT triggering circuits and to test the operation of AC voltage controllers.
C408.3	Test the operation of DC choppers and Commutation circuits and Inverters.
C408.4	Perform speed control of DC and Universal motors

Course Title : Wireless Communication

Course Code : 10EC81

Course Index : C409

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C409.1	Able to explain the OSI reference Model and in particular have good Knowledge of layer 1, 2.
C409.2	Identify different accessing methods, different types of local area networks standards and protocols
C409.3	Able to identify different types of Network Devices and their Functionalities and clear knowledge about internet protocols.
C409.4	Evaluate different network layer and transport layer protocols

Course Title : Digital Switching Systems

Course Code : 10EC82

Course Index : C410

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C410.1	Describe the development of telecommunication, network structures, services and telecommunication transmission methods.
C410.2	Interpret the types of switching systems, concepts of switching system hierarchy, DSS building blocks and basic call processing.
C410.3	Analyze the telecommunication traffic using Erlang distribution and Explain time, space switching.
C410.4	Discuss the principles of system software and software linkages during a call in a Digital Switching Systems.
C410.5	Illustrate the importance of software maintenance and its effect on reliability of

	a DSS.
C410.6	Explain the hardware and software architecture of a Generic Digital Switching System.

Course Title : Network Security

Course Code : 10EC832

Course Index : C411

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C411.1	Discuss the principles of cryptography to construct robust security system. Design encrypting and decrypting algorithms using symmetric cipher.
C411.2	Design encrypting and decrypting algorithms using public key cryptosystems, authentication function.
C411.3	Analyze threats in web and counter measures available to enhance security of web and online applications.
C411.4	Distinguish the risks of cryptanalytic attacks and to provide data security using various password management techniques.
C411.5	Explain firewall requirements and configuration.

Course Title : GSM

Course Code : 10EC843

Course Index : C412

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C412.1	Interpret GSM architecture; comprehend the interference reducing mechanism in GSM and use of Smart antenna.
C412.2	Describe GSM Logical channels, frame structure and speech coding in GSM.
C412.3	Describe Data services, call flow scenarios, security algorithms and token based authentication techniques for providing privacy and security to GSM.
C412.4	Apply the knowledge of models, spectral efficiency, receiver sensitivity, modulation schemes, link budget, data encryption techniques for planning and management of GSM networks.

Course Title : Project Work

Course Code : 10ECP85

Course Index : C413

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C413.1	Apply the knowledge, identify and Collect information to deduce a problem definition for project through detailed review.
C413.2	Identify applicable tools and methodology to implement the proposed project.
C413.3	Design and develop sustainable solution for the betterment of society with future enhancements and lifelong learning.
C413.4	Effectively present the work with professional ethics as an individual or working as a team.

Course Title : Seminar

Course Code : 10ECS86

Course Index : C414

COURSE OUTCOMES (CO): On completion of this course, students are able to:

CO	Course Outcomes
C414.1	Identify and review research literature and comprehend solutions that exist to ECE problems.
C414.2	Understand the techniques, skills and use applicable tools necessary for presenting the authorized work.
C414.3	Communicate effectively on contemporary areas/trends/developments in Engineering fields and develop technical reports.
C414.4	Effectively present the work with professional ethics as an individual.
C414.5	Understand the impact of authorized work in societal and environmental context.