

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Outcomes-2018 Scheme

S.No.	Subject Code	Course Code	Course Outcomes
1	18MAT11 Calculus and Linear Algebra	C101.1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve
		C101.2	Learn the notion of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians
		C101.3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes
		C101.4	Solve first order linear/ nonlinear differential equation analytically using standard methods
		C101.5	Make use of matrix theory for solving system of linear equations and compute eigenvalues and eigenvectors required for matrix diagonalization process

S.No.	Subject Code	Course Code	Course Outcomes
2	18CHE12 Engineering Chemistry	C102.1	Use of free energy in equilibria, rationalize bulk properties and processes using thermodynamic considerations, electrochemical energy systems
		C102.2	Causes & effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electroless plating
		C102.3	Production & consumption of energy for industrialization of country and living standards of people. Electrochemical and concentration cells. Classical, modern batteries and fuel cells. Utilization of solar energy for different useful forms of energy
		C102.4	Environmental pollution, waste management and water chemistry
		C102.5	Different techniques of instrumental methods of analysis. Fundamental principles of nano materials

S.No.	Subject Code	Course Code	Course Outcomes
3	18CPS13 C Programming for Problem Solving	C103.1	Illustrate simple algorithms from the different domains such as mathematics, physics, etc
		C103.2	Construct a programming solution to the given problem using C
		C103.3	Identify and correct the syntax and logical errors in C programs
		C103.4	Modularize the given problem using functions and structures

S.No.	Subject Code	Course Code	Course Outcomes
4	18ELN14 Basic Electronics	C104.1	Describe the operation of diodes, BJT, FET and Operational Amplifiers
		C104.2	Design and explain the construction of rectifiers, regulators, amplifiers and oscillators
		C104.3	Describe general operating principles of SCRs and its application
		C104.4	Explain the working and design of Fixed voltage IC regulator using 7805 and astable oscillator using Timer IC 555
		C104.5	Explain the different number system and their conversions and construct simple combinational and sequential logic circuits using Flip-flops
		C104.6	Describe the basic principle of operation of communication system and mobile phones

S.No.	Subject Code	Course Code	Course Outcomes
5	18ME15 Element of Mechanical Engineering	C105.1	Identify different sources of energy and their conversion process
		C105.2	Explain the working principle of hydraulic turbines, pumps, IC engines and refrigeration
		C105.3	Recognize various metal joining processes and power transmission elements
		C105.4	Understand the properties of common engineering materials and their applications in engineering industry
		C105.5	Discuss the working of conventional machine tools, machining processes, tools and accessories
		C105.6	Describe the advanced manufacturing systems

S.No.	Subject Code	Course Code	Course Outcomes
6	18CHEL16 Engineering Chemistry Lab	C106.1	Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results
		C106.2	Carrying out different types of iterations for estimation of concerned in materials using comparatively more quantities of materials involved for good results

S.No.	Subject Code	Course Code	Course Outcomes
7	18CPL17 C Programming Lab	C107.1	Write algorithms, flowcharts and program for simple problems
		C107.2	Correct syntax and logical errors to execute a program
		C107.3	Write iterative and wherever possible recursive programs
		C107.4	Demonstrate use of functions, arrays, strings, structures and pointers in problem solving

S.No.	Subject Code	Course Code	Course Outcomes
8	18EGH18 Technical English-1	C108.1	Use grammatical English and essentials of language skills and identify the nuances of phonetics, intonation and flawless pronunciation
		C108.2	Implement English vocabulary at command and language proficiency
		C108.3	Identify common errors in spoken and written communication
		C108.4	Understand and improve the non-verbal communication and kinesics
		C108.5	Perform well in campus recruitment, engineering and all other general competitive examinations

S.No.	Subject Code	Course Code	Course Outcomes
9	18MAT21 Advanced Calculus and Numerical Methods	C109.1	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the inter dependence of line, surface and volume integrals
		C109.2	Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations
		C109.3	Construct a variety of partial differential equations and solution by exact methods/ method of separation of variables

		C109.4	Explain the applications of infinite series and obtain series solution of ordinary differential equations
		C109.5	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena

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10	18PHY22 Engineering Physics	C110.1	Understood various types of oscillations and their implications, the role of Shock waves in various fields and recognize the elastic properties of materials for engineering applications
		C110.2	Realize the interrelation between time varying electric field and magnetic field, the transverse nature of the EM waves and their role in optical fibre communication
		C110.3	Compute Eigen values, Eigen functions, momentum of Atomic and subatomic particles using Time independent 1-D Schrodinger's wave equation
		C110.4	Apprehend theoretical background of laser, construction and working of different types of lasers and its applications in different fields
		C110.5	Understand various electrical and thermal properties of materials like conductors, semiconductors and dielectrics using different theoretical models

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11	18ELE23 Basic Electrical Engineering	C111.1	Analyse D.C and A.C circuits
		C111.2	Explain the principle of operation and construction of single-phase transformers
		C111.3	Explain the principle of operation and construction of DC machines and synchronous machines
		C111.4	Explain the principle of operation and construction of three phase induction motors
		C111.5	Discuss concepts of electrical wiring, circuit protecting devices and earthing

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12	18CIV24 Elements of Civil	C112.1	Mention the applications of various fields of Civil Engineering
		C112.2	Compute the resultant of given force system subjected to various loads

	Engineering and Mechanics	C112.3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads
		C112.4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections
		C112.5	Express the relationship between the motion of bodies and analyze the bodies in motion

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13	18EGDL25 Engineering Graphics	C113.1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes
		C113.2	Produce computer generated drawings using CAD software
		C113.3	Use the knowledge of orthographic projections to represent engineering information/ concepts and present the same in the form of drawings
		C113.4	Develop isometric drawings of simple objects reading the orthographic projections of those objects
		C113.5	Convert pictorial and isometric views of simple objects to orthographic views

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14	18PHYL26 Engineering Physics Lab	C114.1	Apprehend the concepts of interference of light, diffraction of light, Fermi energy and magnetic effect of current
		C114.2	Understand the principles of operations of optical fibres and semiconductor devices such as Photodiode, and NPN transistor using simple circuits
		C114.3	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures
		C114.4	Recognize the resonance concept and its practical applications
		C114.5	Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results

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15	18ELEL27 Basic Electrical	C115.1	Identify the common electrical components and measuring instruments used for conducting experiments in the electrical laboratory

	Engineering Lab	C115.2	Compare power factor of lamps
		C115.3	Determine impedance of an electrical circuit and power consumed in a 3-phase load
		C115.4	Determine earth resistance and understand two way and three-way control of lamps

S.No.	Subject Code	Course Code	Course Outcomes
16	18EGH28 Technical English-II	C116.1	Identify common errors in spoken and written communication
		C116.2	Get familiarized with English vocabulary and language proficiency
		C116.3	Improve nature and style of sensible writing and acquire employment and workplace communication skills
		C116.4	Improve their Technical Communication Skills through Technical Reading and Writing practices
		C116.5	Perform well in campus recruitment, engineering and all other general competitive examinations

S.No.	Subject Code	Course Code	Course Outcomes
17	18MAT31 Transform Calculus, Fourier Series and Numerical Techniques	C201.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering
		C201.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
		C201.3	Make use of Fourier transform and Z-transform to illustrate discrete/ continuous function arising in wave and heat propagation, signals and systems
		C201.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods
		C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis

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18	18EC32 Network Theory	C202.1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star- delta

			transformation/ source transformation/ source shifting
		C202.2	Solve network problems by applying Superposition/ Thevenin's/ Norton's/ Maximum Power Transfer/ Millman's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions
		C202.3	Calculate current and voltages for the given circuit under transient conditions and Apply Laplace transform to solve the given network
		C202.4	Solve the given network using specified two port network parameters- Z, Y, T & h
		C202.5	Understand the concept of resonance and determine the parameters that characterize series/ parallel Resonant Circuits

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19	18EC33 Electronics Devices	C203.1	Understand the principles of semiconductor Physics
		C203.2	Understand the principles and characteristics of different types of semiconductor devices
		C203.3	Understand the fabrication process of semiconductor devices
		C203.4	Utilize the mathematical models of semiconductor junctions for circuits and systems
		C203.5	Identify the mathematical models of MOS transistors for circuits and systems

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20	18EC34 Digital System Design	C204.1	Explain the concept of combinational and sequential logic circuits
		C204.2	Analyze and design the combinational logic circuits
		C204.3	Describe and characterize flip-flops and its applications
		C204.4	Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines
		C204.5	Design applications of Combinational & Sequential Circuits

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21	18EC35	C205.1	Explain the basic organization of a computer system

	Computer Organization and Architecture	C205.2	Describe the addressing modes, instruction formats and program control statement
		C205.3	Explain different ways of accessing an input/output device including interrupts
		C205.4	Illustrate the organization of different types of semiconductor and other secondary storage memories
		C205.5	Illustrate simple processor organization based on hardwired control and micro programmed control

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22	18EC36 Power Electronics and Instrumentation	C206.1	Build and test circuits using power electronic devices
		C206.2	Analyze and design-controlled rectifier, DC to DC converters, DC to AC inverters and SMPS
		C206.3	Analyze instrument characteristics and errors
		C206.4	Describe the principle of operation and develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency
		C206.5	Explain the principle, design and analyze the transducers for measuring physical parameters

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23	18ECL37 Electronics Devices & Instrumentation Lab	C207.1	Recognize and demonstrate functioning of semiconductor power devices
		C207.2	Evaluate the characteristics, switching, power conversion and control by semiconductor power devices
		C207.3	Analyze the response and plot the characteristics of transducers such as LDR, Photo diode, etc
		C207.4	Design and test simple electronic circuits for measurement of temperature and resistance
		C207.5	Use circuit simulation software for the implementation and characterization of electronic circuits and devices

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24	18ECL38 Digital System Design Lab	C208.1	Design, realize and verify De Morgan's Theorem, SOP, POS forms
		C208.2	Demonstrate the truth table of various expressions and combinational circuits using logic gates

		C208.3	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers
		C208.4	Construct flip-flops, counters and shift registers
		C208.5	Simulate Serial adder and Binary Multiplier

S.No.	Subject Code	Course Code	Course Outcomes
25	18KAK/ KVK39 Adalitha Kannada/ Vyavaharika Kannada	C209.1	Read, learn and understand the simple words in Kannada language
		C209.2	Create some interest on Kannada Language and Literature

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26	18MATDIP31 Diploma Maths	C210.1	Apply concepts of complex numbers and vector algebra to analyse the problems arising related area
		C210.2	Use derivatives and partial derivatives to calculate rate of change of multivariate functions
		C210.3	Analyse position, velocity, acceleration in two and three dimensions of vector valued functions
		C210.4	Learn techniques of integration including the evaluation of double and triple integrals
		C210.5	Identify and solve first order ordinary differential equations

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27	18MAT41 Complex Analysis, Probability and Statistical Analysis	C211.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory
		C211.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing
		C211.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field
		C211.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data
		C211.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis

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28	18EC42 Analog Circuits	C212.1	Understand the characteristics of BJTs and FETs
		C212.2	Design and analyze BJT and FET amplifier circuits
		C212.3	Design sinusoidal and non-sinusoidal oscillators
		C212.4	Understand the functioning of linear ICs
		C212.5	Design of Linear IC based circuits

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29	18EC43 Control Systems	C213.1	Develop the mathematical model of mechanical and electrical systems
		C213.2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method
		C213.3	Determine the time domain specifications for first and second order systems
		C213.4	Determine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus technique
		C213.5	Determine the stability of a system in the frequency domain using Nyquist and bode plots

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30	18EC44 Engineering Statistics and Linear Algebra	C214.1	Analyze and evaluate single and multiple random variables
		C214.2	Identify and associate Random Variables and Random Processes in Communication events
		C214.3	Analyze and model the Random events in typical communication events to extract quantitative statistical parameters
		C214.4	Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency
		C214.5	Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and Eigen values

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31	18EC45 Signals and Systems	C215.1	Analyze the different types of signals and systems
		C215.2	Determine the linearity, causality, time-invariance and stability properties of continuous and discrete time systems
		C215.3	Evaluate the convolution sum and integral

		C215.4	Represent continuous and discrete signals & systems in frequency domain using Fourier representations
		C215.5	Analyze discrete time signals and systems using Z-transforms

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32	18EC46 Microcontrollers	C216.1	Explain the difference between Microprocessor & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing of 8051 to external memory and Instruction set of 8051
		C216.2	Write 8051 Assembly level programs using 8051 instructions set
		C216.3	Explain the Interrupt system, operation of Timers/ Counters and Serial port of 8051
		C216.4	Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C Programme to send & receive serial data using 8051 serial port
		C216.5	Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports

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33	18ECL47 Microcontroller Lab	C217.1	Enhance programming skills using Assembly language and C
		C217.2	Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051
		C217.3	Interface different input and output devices to 8051 and control them using Assembly language programs
		C217.4	Interface the serial devices to 8051 and do the serial transfer using C programming
		C217.5	Develop applications based on Microcontroller 8051

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34	18ECL48 Analog Circuits Lab	C218.1	Analyze Frequency response of JFET/ MOSFET amplifier
		C218.2	Design BJT/ FETs amplifier with and without feedback and evaluate their performance characteristics

		C218.3	Apply the knowledge gained in the design of BJT/ FET circuits in Oscillators
		C218.4	Design analog circuits using OPAMPs for different applications
		C218.5	Simulate and analyze analog circuits that uses ICs for different electronic applications

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35	18CPC49 Constitution of India, Professional Ethics and Cyber Law	C219.1	Describe and analyze the role and salient features of the Indian Constitution
		C219.2	Understand the structure and powers of the Union and State Executives
		C219.3	Relate to the procedures and provisions in the electoral process
		C219.4	Develop Engineering and Professional ethics and adopt the responsibilities expected of an Engineer
		C219.5	Identify the cybercrimes and describe the cyber laws for cyber safety measures

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36	18MATDIP41 Linear Algebra, Numerical Methods and Probability	C220.1	Solve systems of linear equations using matrix algebra
		C220.2	Apply the knowledge of numerical methods in modelling and solving engineering problems
		C220.3	Make use of analytical methods to solve higher order differential equations
		C220.4	Classify partial differential equations and solve them by exact methods
		C220.5	Apply elementary probability theory and solve related problems

S.No.	Subject Code	Course Code	Course Outcomes
37	18ES51 Technological Innovation, Management and Entrepreneurship	C301.1	Understand the fundamental concepts of Management and Entrepreneurship and opportunities in order to setup a business
		C301.2	Identify the various organizations' architecture
		C301.3	Describe the functions of Managers, Entrepreneurs and their social responsibilities
		C301.4	Understand the components in developing a business plan
		C301.5	Recognize the various sources of funding and institutions supporting entrepreneurs

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38	18EC52 Digital Signal Processing	C302.1	Determine response of LTI systems using time domain and DFT techniques
		C302.2	Compute DFT of real and complex discrete time signals
		C302.3	Compute DFT using FFT algorithms and linear filtering approach
		C302.4	Design and realize FIR and IIR digital filters
		C302.5	Understand the DSP processor architecture

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39	18EC53 Principles of Communication Systems	C303.1	Analyze and compute performance of AM and FM modulation in the presence of noise at the receiver
		C303.2	Analyze and compute performance of digital formatting processes with quantization noise
		C303.3	Multiplex digitally formatted signals at Transmitter
		C303.4	Demultiplex the signs and reconstruct digitally formatted signals at the receiver
		C303.5	Design/ Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission

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40	18EC54 Information Theory & Coding	C304.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source
		C304.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
		C304.3	Model the continuous and discrete communication channels using input, output and joint probabilities
		C304.4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
		C304.5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes

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41	18EC55	C305.1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by

	Electromagnetic Waves		applying conventional methods and charge in a volume
		C305.2	Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem
		C305.3	Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations
		C305.4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits
		C305.5	Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and Evaluate power associated with EM waves using Poynting theorem

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42	18EC56 Verilog HDL	C306.1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction
		C306.2	Design and verify the functionality of digital circuit/ system using test benches
		C306.3	Identify the suitable Abstraction level for a particular digital design
		C306.4	Write the programs more effectively using Verilog tasks, functions and directives
		C306.5	Perform timing and delay Simulation and Interpret the various constructs in logic synthesis

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43	18ECL57 Digital Signal Processing Lab	C307.1	Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals
		C307.2	Model the discrete time signals and systems and verify its properties and results
		C307.3	Implement discrete computations using DSP processor and verify the results
		C307.4	Realize the digital filters using a simulation tool and analyze the response of the filter for an audio signal
		C307.5	Write programs using Matlab/ Scilab/ Octave to illustrate DSP concepts

S.No.	Subject Code	Course Code	Course Outcomes
44	18ECL58 HDL Lab	C308.1	Write the Verilog/ VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions
		C308.2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms
		C308.3	Use FPGA/ CPLD kits for down loading Verilog codes and check output
		C308.4	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware
		C308.5	Interface the hardware to the programmable chips and obtain the required output

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45	18CIV59 Environmental Studies	C309.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
		C309.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment
		C309.3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
		C309.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues
		C309.5	Relate to the latest Developments in Environmental Pollution Mitigation Tools

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46	18EC61 Digital Communication	C310.1	Associate and apply the concepts of Bandpass sampling to well specified signals and channels
		C310.2	Analyze and compute performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels
		C310.3	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels
		C310.4	Demonstrate that bandpass signals subjected to corruption and distortion in a bandlimited channel can be processed at the receiver to meet specified performance criteria

		C310.5	Understand the principles of spread spectrum communications
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47	18EC62 Embedded Systems	C311.1	Describe the architectural features and instructions of 32-bit microcontroller ARM Cortex M3
		C311.2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications
		C311.3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system
		C311.4	Develop the hardware software co-design and firmware design approaches
		C311.5	Explain the need of real time operating system for embedded system applications

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48	18EC63 Microwave and Antenna	C312.1	Describe the use and advantages of microwave transmission
		C312.2	Analyze various parameters related to microwave transmission lines and waveguides
		C312.3	Identify microwave devices for several applications
		C312.4	Analyze various antenna parameters necessary for building a RF system
		C312.5	Recommend various antenna configurations according to the applications

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49	18EC644 Digital System Design using Verilog	C313.1	Construct the combinational circuits, using discrete gates and programmable logic devices
		C313.2	Describe how arithmetic operations can be performed for each kind of code, and also combinational circuits that implement arithmetic operations
		C313.3	Design a semiconductor memory for specific chip design
		C313.4	Design embedded systems using small microcontrollers, larger CPUs/ DSPs, or hard or soft processor cores
		C313.5	Synthesize different types of I/O controllers that are used in embedded system

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50	18CS653 Object Oriented Programming using JAVA	C314.1	Explain the object-oriented concepts and JAVA
		C314.2	Develop computer programs to solve real world problems in Java
		C314.3	Develop simple GUI interfaces for a computer program to interact with users

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51	18ECL66 Embedded Systems Lab	C315.1	Understand the instruction set of 32-bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language
		C315.2	Develop assembly language programs using ARM Cortex M3 for different applications
		C315.3	Interface external devices and I/O with ARM Cortex M3
		C315.4	Develop C language programs and library functions for embedded system applications
		C315.5	Analyze the functions of various peripherals, peripheral registers and power saving modes of ARM Cortex M3

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52	18ECL67 Communication Lab	C316.1	Design and test circuits for analog modulation and demodulation schemes viz., AM, FM, etc
		C316.2	Determine the characteristics and response of microwave waveguide
		C316.3	Determine characteristics of microstrip antennas and devices & compute the parameters associated with it
		C316.4	Design and test the digital and analog modulation circuits and display the waveforms
		C316.5	Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes

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53	18ECMP68 Mini-Project	C317.1	Perform a literature search to review current knowledge and developments in the chosen technical area.
		C317.2	Undertake detailed technical work in the chosen area using one or more such as: Theoretical

			studies, Computer simulations, Hardware construction in the chosen application
		C317.3	Prepare reports to establish work completed, and to schedule any additional changes to be done within the specified time frame for the project.
		C317.4	Deliver presentation on the area of work being done and any specific contributions done related to the field of work
		C317.5	Prepare a formal report describing the work undertaken and results obtained also to publish work in National / International proceedings to compete and upgrade the work

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54	18EC71 Computer Networks	C401.1	Understand the concepts of networking
		C401.2	Describe the various networking architectures
		C401.3	Identify the protocols and services of different layers
		C401.4	Distinguish the basic network configurations and standards associated with each network
		C401.5	Analyze a simple network and measure its parameters

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55	18EC72 VLSI Design	C402.1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling
		C402.2	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects
		C402.3	Demonstrate ability to design Combinational, sequential and dynamic logic circuits as per the requirements
		C402.4	Interpret Memory elements along with timing considerations
		C402.5	Interpret testing and testability issues in VLSI Design

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56	18EC733 Digital Image Processing	C403.1	Describe the fundamentals of digital image processing
		C403.2	Understand image formation and the role human visual system plays in perception of gray and color image data

		C403.3	Apply image processing techniques in both the spatial and frequency (Fourier) domains
		C403.4	Design and evaluate image analysis techniques
		C403.5	Conduct independent study and analysis of Image Enhancement and restoration techniques

S.No.	Subject Code	Course Code	Course Outcomes
57	18EC745 Machine Learning Using Python	C404.1	Identify the problems in machine learning
		C404.2	Select supervised, unsupervised or reinforcement learning for problem solving
		C404.3	Apply theory of probability and statistics in machine learning
		C404.4	Apply concept learning, ANN, Bayes classifier, k nearest neighbour
		C404.5	Perform statistical analysis of machine learning techniques

S.No.	Subject Code	Course Code	Course Outcomes
58	18CV753 Environmental Engineering	C405.1	Appreciate the elements of Corporate Environmental Management systems complying to international environmental management system standards
		C405.2	Lead pollution prevention assessment team and implement waste minimization options
		C405.3	Develop, Implement, maintain and Audit Environmental Management systems for Organizations

S.No.	Subject Code	Course Code	Course Outcomes
59	18ECL76 Computer Networks Lab	C406.1	Choose suitable tools to model a network
		C406.2	Use the network simulator for learning and practice of networking algorithms
		C406.3	Illustrate the operations of network protocols and algorithms using C programming
		C406.4	Simulate the network with different configurations to measure the performance parameters
		C406.5	Implement the data link and routing protocols using C programming

S.No.	Subject Code	Course Code	Course Outcomes
60	18ECL77 VLSI Lab	C407.1	Design and simulate combinational and sequential digital circuits using Verilog HDL

		C407.2	Understand the Synthesis process of digital circuits using EDA tool
		C407.3	Perform ASIC design flow and understand the process of synthesis, synthesis constraints and evaluating the synthesis reports to obtain optimum gate level net list
		C407.4	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers
		C407.5	Perform RTL-GDSII flow and understand the stages in ASIC design

S.No.	Subject Code	Course Code	Course Outcomes
61	18ECP78 Project Work Phase-I	C408.1	Perform a literature search to review current knowledge and developments in the chosen technical area.
		C408.2	Undertake detailed technical work in the chosen area using one or more such as: Theoretical studies, Computer simulations, Hardware construction.
		C408.3	Prepare progress reports or maintain a professional journal to establish work completed, and to schedule additional work within the time frame specified for the project.
		C408.4	Deliver a seminar on the general area of work being undertaken and specific contributions to that field
		C408.5	Prepare a formal report describing the work undertaken and results obtained so far

S.No.	Subject Code	Course Code	Course Outcomes
62	18EC81 Wireless and Cellular Communication	C409.1	Understand the Communication theory both Physical and networking associated with GSM, CDMA & LTE 4G systems
		C409.2	Explain concepts of propagation mechanisms like Reflection, Diffraction, Scattering in wireless channels
		C409.3	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a GSM cellular network
		C409.4	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a CDMA cellular network
		C409.5	Understand the Basic operations of Air interface in a LTE 4G system

S.No.	Subject Code	Course Code	Course Outcomes
63	18EC825 Biomedical Signal Processing	C410.1	Possess the basic mathematical, scientific and computational skills necessary to analyse ECG and EEG signals
		C410.2	Apply classical and modern filtering and compression techniques for ECG and EEG signals
		C410.3	Develop a thorough understanding on basics of ECG and EEG feature extraction
		C410.4	Evaluate various event detection techniques for the analysis of the EEG and ECG
		C410.5	Develop algorithms to process and analyze biomedical signals for better diagnosis

S.No.	Subject Code	Course Code	Course Outcomes
64	18ECP83 Project Work Phase-II	C411.1	Perform a literature search to review current knowledge and developments in the chosen technical area.
		C411.2	Undertake detailed technical work in the chosen area using one or more such as: Theoretical studies, Computer simulations, Hardware construction.
		C411.3	Prepare progress reports or maintain a professional journal to establish work completed, and to schedule additional work within the time frame specified for the project.
		C411.4	Deliver a seminar on the general area of work being undertaken and specific contributions to that field
		C411.5	Prepare a formal report describing the work undertaken and results obtained so far

S.No.	Subject Code	Course Code	Course Outcomes
65	18ECS84 Technical Seminar	C412.1	Establish motivation for any topic of interest and develop a thought process for technical presentation.
		C412.2	Develop ability to comprehend multi-disciplinary engineering technological concept within ethical, environmental and social contexts.
		C412.3	Analysis and comprehension of proof-of-concept and related data.
		C412.4	Effective presentation with professional objectives and integrating ethical values
		C412.5	Compile the technical document and prepare report

S.No.	Subject Code	Course Code	Course Outcomes
66	18ECI85 Internship	C413.1	Construct the company profile by compiling the brief history, management structure, products / services offered, key achievements and market performance for his / her organization of internship.
		C413.2	Determine the challenges and future potential for his / her internship organization in particular and the sector in general.
		C413.3	Test the theoretical learning in practical situations by accomplishing the tasks assigned during the internship period.
		C413.4	Apply various soft skills such as time management, positive attitude and communication skills during performance of the tasks assigned in internship organization
		C413.5	Analyze the functioning of internship organization and recommend changes for improvement in processes.