# Sapthagiri College of Engineering

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## Department of Electronics & Communication Engineering


## Course Outcomes (2015-2019)

| 2015 Batch I Year | | |
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| **Course Name Subject Name /Subject code/ Course code** | | **Course Outcomes-**<br><br>**On completion of this course the students will be able to** |
| Engineering Mathematics – I/15MAT11/ C101 | C101.1 | Find $n^{th}$ derivative of standard functions, Radius of Curvature and angle between curves of functions in Cartesian and Polar form. |
| | C101.2 | Find Taylor's and Maclaurin's series of the functions, the limits in indeterminate form and to solve the problems on Partial differentiation. |
| | C101.3 | Find the velocity, acceleration, gradient, curl, divergence using vector identities in two and three dimensions. |
| | C101.4 | Find the integrals involving Sinnx, Cosnx, SinnxCosnx between the limits 0 to $\pi/2$. |
| | C101.5 | Solve the ordinary first order and first degree differential equations and system of linear equations by using different techniques of Linear Algebra. |
| Engineering Physics/15PHY12/ C102 | C102.1 | Describe the fundamentals of Modern Physics and Quantum Mechanics and apply to wave mechanics. |
| | C102.2 | Differentiate the conductivity of conductors, semiconductors and super conductors based on Quantum theory |
| | C102.3 | Explain basic principles, types and applications of Laser and Optical fibres. |
| | C102.4 | Classify the crystal systems, and analyze crystal structure using XRD |
| | C102.5 | Explain the concept, production and applications of shockwaves. |
| | C102.6 | Explain the synthesis, characterization and applications of Nano materials. |
| Elements of Civil Engineering and Mechanics/15CIV23/ C103 | C103.1 | To make students understand about the scope of different fields of Civil Engineering. The role of Civil Engineers in the Infrastructural development and basic idealizations of mechanics |
| | C103.2 | To make students to analyze Free body diagrams, Lami's theorem, Equations of Equilibrium, equilibrium of concurrent and non concurrent coplanar force systems, friction and types, laws on friction. To solve the |

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| | | various problems on wedge, ladder friction. |
| | C103.3 | To make students to gain the basic knowledge types of beams, supports, support reactions, types of loads, trusses analyzing the various loads on trusses based on method of joints and sections. |
| | C103.4 | To make students to find the centroid of the simple and build-up sections, the moment of inertia of the simple and composite sections |
| | C103.5 | To make students to apply the concepts of kinetics and kinematics, to understand about curvilinear and rectilinear motion and to analyse the various problems based on these. |
| Elements of Mechanical Engineering/15EME14/ C104 | C104.1 | Explain different sources of energy and its conversion |
| | C104.2 | Explain the conversion of energy by prime movers. |
| | C104.3 | Explain the different machine tool operations and basics of Robotics and Automation. |
| | C104.4 | Explain basic engineering materials and identify its application. |
| | C104.5 | Explain the working principle of refrigeration and air conditioning. |
| Basic Electrical Engineering/15ELE15/ C105 | C105.1 | Depict the basic knowledge of electrical quantities for the analysis of basic DC, AC circuits and electromagnetism |
| | C105.2 | Analyze three phase circuits, measure electrical quantities and demonstrate domestic wiring system. |
| | C105.3 | Explain the construction and working of DC machines |
| | C105.4 | Explain the construction and working of AC machines |
| Workshop LAB/15WSL16/ C106 | C106.1 | Demonstrate the use of fitting tools to make models |
| | C106.2 | Demonstrate the use of sheet metals tools to make models. |
| | C106.3 | Demonstrate the use of Welding tools to make models. |
| Engineering Physics Lab/15PHYL17/ C107 | C107.1 | Formulate, Conduct and inference of the Engineering physics experiments. |
| | C107.2 | Characterize the semiconducting materials. |
| | C107.3 | Determine the physical parameters in optical experiments. |

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| | C107.4 | Find the mechanical properties of materials. |
| | C107.5 | Identify and verify the passive electronic components |
| Engineering Mathematics –II/ 15MAT21/ C108 | C108.1 | Solve linear and nonlinear ordinary differential equations of higher degree. |
| | C108.2 | Solve the Partial differential equations of Fluid Mechanics, Electromagenetic Theory & Heat transfer |
| | C108.3 | Find Area, Volume, Moment of Inertia of Plane and Solids using double and triple integrals. |
| | C108.4 | Relate Beta and Gamma functions and its properties. |
| | C108.5 | Solve initial and boundary value problems of ODE using Laplace Transforms. |
| Engineering Chemistry/15CHE22/ C109 | C109.1 | Describe Electrochemical & concentration cells, Classical & modern batteries and fuel cells. |
| | C109.2 | Analyze the Causes, effects, control and prevention of corrosion of metals. |
| | C109.3 | Describe types of fuels, PhotoVoltaic cells and Determine calorific value of Fuels. |
| | C109.4 | Explain synthesis, properties and applications of polymers. |
| | C109.5 | Explain the quality parameters and treatment of water and synthesis, properties and applications of nano materials. |
| C Programming for Problem Solving/15PCD23/ C110 | C110.1 | Illustrate simple algorithms and flowcharts for problem solving skills |
| | C110.2 | Make use of the basic principles of Programming in C language |
| | C110.3 | Develop modular programming skills. |
| | C110.5 | Explain the basic concepts of pointers. |
| | C110.6 | Utilization of memory using pointer concepts and data structures. |
| Computer Aided Engineering Drawing/15CED24/ C111 | C111.1 | Demonstrate the usage of CAD software. |
| | C111.2 | Visualize and draw Orthographic projections, Sections of solids and Isometric views of solids |
| | C111.3 | Evaluated for their ability in applying various concepts to solve |

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| | | practical problems related to engineering drawing |
| Basic Electronics/15ELN25/ C112 | C112.1 | Describe the applications of diode in rectifiers, filter circuits and wave shaping circuit. |
| | C112.2 | Describe the importance of transistors in electronic circuits. Appreciate the concept of control flow of charges. Compare various transistor configurations. Understand the concept of biasing and various biasing circuits |
| | C112.3 | Design simple circuits like amplifiers (inverting and non inverting), comparators, adders, integrator and differentiator using OPAMPS |
| | C112.4 | Explain the different building blocks in digital electronics using logic gates and implement simple logic function using basic, universal gates. |
| | C112.5 | Explain the functioning of a communication system and different modulation technologies and describe the basic principle and working of various types of Transducers. |
| Computer Programming Laboratory/15PCL26/ C113 | C113.1 | Write flowcharts, algorithms and program for simple problems |
| | C113.2 | Identify Syntax and logical errors to execute a program |
| | C113.3 | Develop iterative and recursive programs |
| | C113.4 | Demonstrate use of functions, arrays, strings, structures and pointers in problem solving |
| Engineering Chemistry Lab/15CHEL27/ C114 | C114.1 | Analyze hardness of water and quality of cement |
| | C114.2 | Analyze copper and iron metal from its alloy and ore. |
| | C114.3 | Analyze waste water and Alkalinity of water sample. |
| | C114.4 | Estimate the strength and concentration of acids. |
| | C114.5 | Measure the viscosity coefficient of organic liquids |
| Environmental Studies/15CIV28/ C115 | C115.1 | Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale |
| | C115.2 | Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment. |
| | C115.3 | Demonstrate ecology knowledge of a complex relationship between predators, prey, and the plant community. |

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| | C115.4 | Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues. |
| **2015 Batch II Year** | | |
| **Engineering Mathematics –III /15MAT31/ C201** | C201.1 | Find the Fourier series, half range Fourier series and Fourier coefficients of periodic functions. |
| | C201.2 | Find the Fourier and inverse Fourier transforms of periodic functions. |
| | C201.3 | Solve the finite difference equations using Z-transforms |
| | C201.4 | Apply the concept of statics for curve fitting, correlation and regression. |
| | C201.5 | Analyze and apply proper numerical techniques to solve the algebraic/transcendental equation, to find polynomials, intermediate values and evaluation of integrals |
| | C201.6 | Find the integrals using Green's, Stokes and Gauss divergence theorem and external of a functional |
| **Analog Electronics/15EC32/ C202** | C202.1 | Analyse the working and characteristics of BJT, FET, Single stage, cascaded and feedback amplifiers. |
| | C202.2 | Analyse and design different oscillators using BJT/FET and explain UJT relaxation oscillator. |
| | C202.3 | Calculate the AC gain and impedance for BJT using re and h parameters models for CE and CC configuration. |
| | C202.4 | Analyse and determine the performance characteristics and parameters of BJT and FET amplifier using small signal model. |
| | C202.5 | Design and Evaluate the efficiency of Class A and Class B power amplifiers and explain the operation of voltage regulators |
| **Digital Electronics/15EC33 / C203** | C203.1 | Develop simplified switching equations using Karnaugh Maps |
| | C203.2 | Define, Analyse and Design various combinational circuits. |
| | C203.3 | Define, analyse and design various sequential circuits, counters Registers, mealy and Moore model. |

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| **Network Analysis/15EC34/ C204** | C204.1 | Solve problems related to series and parallel combination of Passive Components, Source transformation and Source Shifting. |
| | C204.2 | Solve problems related to Network Theorems and Electrical laws to reduce circuit complexities and to arrive at feasible solutions. |
| | C204.3 | Solve problems related to various Two port Parameters and their Relationship for finding Network Solutions. |
| | C204.4 | Analyse the Performance of various Types of Networks Using different concepts and principles. |
| **Electronic Instrumentation/15EC35/ C205** | C205.1 | Distinguish between various types of errors and calculate the same, and describe the operation of ammeters, voltmeters and multimeters and develop circuits for multi range Ammeters and Voltmeters |
| | C205.2 | Describe functional concepts and operation of Digital voltmeters and instruments to measure frequency, time period, phase difference of signals, rotation speed, capacitance and pH of solutions and microprocessor-based instrumentation |
| | C205.3 | Describe the operation of analog oscilloscope, digital storage oscilloscope and different types of signal generators |
| | C205.4 | Describe functional concepts of various Analog measuring instruments to measure field Strength, impedance, stroboscopic speed, Q of coils, insulation resistance and analyse AC and DC bridges for passive component and frequency measurements. |
| | C205.5 | Classify different types of transducers for different applications |
| **Engineering Electromagnetics/15EC36/ C206** | C206.1 | Evaluate the problems on Electric Fields due to different charge distributions by applying conventional methods and gauss law |
| | C206.2 | Solve problems related to Poisson's and Laplace's Equations, Uniqueness theorem, and solution of Laplace's equation and steady magnetic field. |
| | C206.3 | Analyse and solve problems related to Magnetic Forces, Time-varying fields using Maxwell's equations |
| | C206.4 | Evaluate power associated with electromagnetic waves waves using Poynting theorem |

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| **Analog Electronics Lab/15ECL37/ C207** | C207.1 | Design and Test rectifiers, clipping circuits, clamping circuits and voltage regulators |
| | C207.2 | Determine the parameters from the characteristics of JFET and MOSFET devices |
| | C207.3 | Evaluate BJT amplifiers in CE configuration as well as JFET/MOSFET amplifiers |
| | C207.4 | Test a power amplifier and compute its conversion efficiency |
| | C207.5 | Design and test various types of oscillators |
| **Digital Electronics Lab/15ECL38/C208** | C208.1 | Examine the functionality of logic gates. |
| | C208.2 | Design and test various combinational circuits such as adders, subtractors, comparators, multiplexers, demultiplexers and decoders. |
| | C208.3 | Construct and test flips-flops, counters and shift registers. |
| | C208.4 | Simulate full adder and up/down counters. |
| **Engineering Mathematics – IV/15MAT41/ C209** | C209.1 | Apply appropriate numerical methods to solve ordinary differential equations |
| | C209.2 | Derive and Apply Bessel's function, Legendre's polynomials & Rodrigue's formula, and its properties.. |
| | C209.3 | Solve problems on analytic functions using Cauchy–Riemann equations, complex line integrals, conformal and bilinear transformations.. |
| | C209.4 | Analyse and solve the probability distribution problems. |
| | C209.5 | Analyze and interpret the hypothesis for the given sampling distribution and to solve stochastic process problems. |
| **Microprocessor/15EC42 / C210** | C210.1 | Explain basic architecture of 8086 microprocessor and its addressing modes. |
| | C210.2 | Develop assembly level language program using 8086 microprocessors. |
| | C210.3 | Develop 8086 based assembly level language programs using procedures, interrupts and macros. |
| | C210.4 | Design physical memory organization, minimum mode and maximum mode operations of 8086. |
| | C210.5 | Explain interfacing of stepper motor, static RAM, ADC and DAC using 8255 and 8087/8088 architecture. |

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| **Control Systems/15EC43/ C211** | C211.1 | Develop the mathematical model of mechanical and electrical signals. |
| | C211.2 | Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method |
| | C211.3 | Determine the time domain specifications for first and second order systems · |
| | C211.4 | Determine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus Technique. |
| | C211.5 | Determine the stability of a system in the frequency domain using Nyquist and bode plots and develop a control system model in continuous and discrete time using state variable techniques |
| **Signals and Systems/15EC44/ C212** | C212.1 | Classify the different types of signals and systems. |
| | C212.2 | Determine performance of the system in time domain for the given impulse response. |
| | C212.3 | Determine the spectral characteristics of given arbitrary time domain periodic signal |
| | C212.4 | Determine the spectral characteristics of given arbitrary time domain non-periodic signal |
| | C212.5 | Apply Z-transforms, Inverse Z - transforms and determine stability of LTI systems |
| **Principles of Communication Systems/15EC45/ C213** | C213.1 | Determine the performance of amplitude modulation schemes in time and frequency domains. |
| | C213.2 | Determine the performance of frequency modulation schemes in time and frequency domains. |
| | C213.3 | Characterize analog signals in time domain as random processes and in frequency domain using Fourier transforms. |
| | C213.4 | Determine the performance of analog communication systems. |
| | C213.5 | Analyse the characteristics of pulse modulation schemes |
| **Linear Integrated Circuits/15EC46/C214** | C214.1 | Explain op-amp circuit and its parameters. |
| | C214.2 | Design op-amp based DC & AC amplifiers. |
| | C214.3 | Develop Op-Amp based linear and non-linear circuits. |
| | C214.4 | Design first & Second Order Low Pass, High Pass, Band Pass, Band Stop Filters and Voltage Regulators |
| | C214.5 | Develop applications using linear IC's and Timers |

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| **Microprocessor Lab/15ECL47/ C215** | C215.1 | Develop 8086 assembly level programs to perform data transfer, arithmetic and logical operations. |
| | C215.2 | Develop 8086 assembly level programs to sort and search elements in a given array. |
| | C215.3 | Develop string transfer, string reversing, searching a character in a string with string manipulation instructions of 8086. |
| | C215.4 | Develop 8086 programs using concepts of procedures and macros. |
| | C215.5 | Design the 8086 processor-based applications by interfacing input and output devices. |
| **Linear ICs and Communication Lab/15ECL48/ C216** | C216.1 | Design and demonstrate the operation of instrumentation amplifier, oscillators, filters, DAC, adder, differentiator and integrator using linear ICs. |
| | C216.2 | Analyse multivibrator circuits using 555 timer |
| | C216.3 | Design and demonstrate pulse and flat top sampling techniques to generate digital signals |
| | C216.4 | Analyse the performance of AM, FM, DSB-SC and Mixer for communication system. |
| | C216.5 | Design frequency synthesizer by using PLL |
| **2015 Batch III Year** | | |
| **Management and Entrepreneurship Development/15ES51/C301** | C301.1 | Illustrate the fundamental concepts of Management and Planning |
| | C301.2 | Describe the functions of management and differentiate various leadership styles |
| | C301.3 | Describe the functions of Entrepreneurs and their social responsibilities and select a best Entrepreneurship model for the required domain of establishment |
| | C301.4 | Analyse the Institutional support by various state and central government agencies |
| | C301.5 | Apply different project network analysis techniques to design a project and understand the various levels of project management |
| **Digital Signal Processing/15EC52/ C302** | C302.1 | Solve DFT of real and complex discrete time signals. |
| | C302.2 | Determine response of LTI systems using time domain and DFT techniques. |
| | C302.3 | Determine DFT using FFT algorithms and appreciate the computational speed of the algorithms |

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| | C302.4 | Design the digital filters and realize its structure using different forms |
| **Verilog HDL/15EC53/ C303** | C303.1 | Describe the need of HDL with different design styles and design methodologies in HDL |
| | C303.2 | Design combinational logic in Gate level and Data flow style using Verilog HDL. |
| | C303.3 | Design Combinational and sequential circuits in behavioural modelling using Verilog HDL. |
| | C303.4 | Design Combinational and sequential circuits in all the three design styles with VHDL. |
| **Information Theory & Coding/15EC54/C304** | C304.1 | Apply the concept of Entropy for Dependent & Independent Sources and apply encoding techniques |
| | C304.2 | Determine a code word comprising of the check bits computed using Linear Block codes, Cyclic codes & Convolutional codes |
| | C304.3 | Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolution codes |
| | C304.4 | Determine the channel capacity of continuous and discrete communication channels using input, output and joint probabilities. |
| **Operating System/15EC553/ C305** | C305.1 | Explain the goals, structure, operation and types of operating systems. |
| | C305.2 | Apply scheduling techniques to find performance factors. |
| | C305.3 | Explain organization of file systems and IOCS. |
| | C305.4 | Apply suitable techniques for contiguous and non-contiguous memory allocation. |
| | C305.5 | Analyse message passing, dead lock detection and prevention methods. |
| **Object Oriented Programming Using C++/15EC 562/ C306** | C306.1 | Explain the basic concepts of object-oriented programming language |
| | C306.2 | Develop C++ object-oriented program using classes, objects, constructors, destructors and operator overloading. |
| | C306.3 | Explain and Analyse program Streams and Working with files. |

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| **8051 Microcontroller/15EC563/ C307** | C307.1 | Define an embedded system and describe the architecture of 8051 |
| | C307.2 | Apply the instructions in 8051 based embedded application programs. |
| | C307.3 | Apply the concepts of stack and subroutine in designing 8051 programming. |
| | C307.4 | Apply the concepts of timers and serial port UART in in generating delay and serial communication. |
| | C307.5 | Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports and interrupts. |
| **DSP Lab/15ECL57/ C308** | C308.1 | Model analog to digital conversion system using MATLAB |
| | C308.2 | Model discrete time signals and systems and its properties and results |
| | C308.3 | Analyse and implement different discrete computations on DSP processor |
| | C308.4 | Design the digital filters using a simulation tool and a DSP processor and verify the result |
| **HDL Lab/15ECL58/C309** | C309.1 | Simulate Combinational circuits in dataflow, behavioural and Gate level Abstractions. Using VHDL/Verilog |
| | C309.2 | Develop HDL code for sequential circuits like flip flops and counters in behavioural description and show simulation results. |
| | C309.3 | Develop and synthesize HDL code for Combinational and Sequential circuits on FPGA |
| | C309.4 | Develop, synthesize and implement HDL code on FPGA to interface input, output devices |
| **Digital Communication/15EC61/ C310** | C310.1 | Represent signals mathematically and Categorize different line coding formats |
| | C310.2 | Apply the concept of transmission of signals over AWGN channels |
| | C310.3 | Apply the concept of different digital modulation techniques. |
| | C310.4 | Design and analyse the transmission of signals through band limited channels |
| | C310.5 | Apply the principles of secured digital communication systems |

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| **ARM Microcontroller & Embedded Systems/15EC62/ C311** | C311.1 | Describe the architectural features and instructions of 32-bit microcontroller ARM Cortex M3. |
| | C311.2 | Describe the memory map of cortex m3 and apply the knowledge gained for Programming ARM Cortex M3 for different applications. |
| | C311.3 | Apply the knowledge in selecting basic hardware components in the design of embedded systems |
| | C311.4 | Describe the development of an embedded system using the hardware /software co-design and firmware design approaches. |
| | C311.5 | Apply the need of real time operating system for embedded system applications. |
| **VLSI Design/15EC63/C312** | C312.1 | Explain MOS transistor theory and CMOS process flow |
| | C312.2 | Draw stick diagram and layout for logic gates with physical design aspects |
| | C312.3 | Perform scaling of MOS devices and testing of VLSI circuits |
| | C312.4 | Design various subsystems |
| | C312.5 | Explain the basic FPGA Based Systems |
| **Computer Communication Networks/15EC64/ C313** | C313.1 | Identify the layering architecture of OSI reference model and TCP/IP protocol suite |
| | C313.2 | Identify the protocols and functions associated with each layer services. |
| | C313.3 | Describe the different networking architectures and their representations. |
| | C313.4 | List the different routing algorithms for routing of packets for wired communication |
| **Cellular Mobile Communication/15EC651/C314** | C314.1 | Explain statistical characterization of urban mobile channels to compute the performance for simple modulation schemes. |
| | C314.2 | Describe how the trunking interference that affect the overall capacity of cellular system. |
| | C314.3 | Explain the limitations of GSM, GPRS and CDMA to meet high data rate requirements and limited improvements that are needed. |

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| | C314.4 | Analyze the call process procedure between a calling number and called number for all scenarios in GSM or CDMA based systems. |
| | C314.5 | Explain and analyse voice and data call handling for various scenarios in GSM and CDMA systems for national and international interworking situations. |
| **Digital Switching Systems/15EC654/ C315** | C315.1 | Describe the electromechanical switching systems and compare with digital switching system |
| | C315.2 | Describe the telecommunication traffic and its measurements and design grading system. |
| | C315.3 | Compare and explain the technologies associated with the data switching operations |
| | C315.4 | Analyse the different software aspects of switching systems and its maintenance |
| **Digital System Design using Verilog/15EC663/ C316** | C316.1 | Construct and develop Verilog model for combinational and sequential circuits |
| | C316.2 | Design a semiconductor memory for specific chip design. |
| | C316.3 | Inspect IC's that are embedded in package and assembled in PCB's for different application. |
| | C316.4 | Describe synthesized process of different types of processor and I/O controllers that are used in embedded system. |
| | C316.5 | Explain the use of IC design methodologies to analyse complex digital systems. |
| **Embedded Controller Lab/15ECL67/C317** | C317.1 | Develop assembly level program using 32-bit ARM Cortex M3 microcontroller |
| | C317.2 | Develop ARM Cortex M3 based embedded c programs for different applications. |
| | C317.3 | Develop ARM Cortex M3 based embedded systems by interfacing I/O devices |
| | C317.4 | Develop C language programs and library functions for embedded system applications |
| **Computer Networks** | C318.1 | Develop and simulate networking algorithms using network simulator |
| | C318.2 | Make use of c programs to simulate different networking protocols |

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| **Lab/15ECL68/ C318** | C318.3 | Make use of c programs to develop different network configurations and measure the performance parameters. |
| | C318.4 | Make use of c programs to demonstrate the data link and routing protocols using C programming. |
| **2015 Batch IV Year** | | |
| **Microwave and Antennas/15EC71/ C401** | C401.1 | Describe and analyse the microwave sources |
| | C401.2 | Analyse various parameters related to transmission lines and waveguides |
| | C401.3 | Analyse various parameters related to micro wave devices which can be used for several applications |
| | C401.4 | Explain the basics of antenna theory |
| | C401.5 | Analyse various antenna parameters to build RF system and select an antenna for various applications |
| **Digital Image Processing/15EC72/C402** | C402.1 | Explain the fundamental steps in digital image processing and apply some basic relationships between pixels to images |
| | C402.2 | Apply the different image transforms to images |
| | C402.3 | Analyse different restoration techniques and methods used in digital image processing |
| | C402.4 | Apply different color models, wavelet transforms and morphological operations to images |
| | C402.5 | Apply different segmentation techniques to images |
| **Power Electronics/15EC73/ C403** | C403.1 | Describe the characteristics of different power devices and identify their applications associated with it. |
| | C403.2 | Build DC-DC power converter using SCR |
| | C403.3 | Analyse the operation of inverter circuit and static switches. |
| | C403.4 | Determine the output response of a thyristor circuit with various triggering options. |
| | C403.5 | Determine the response of controlled rectifier with resistive and inductive loads. |

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| **Multimedia Communication/15EC 741/ C404** | C404.1 | Classify different multimedia networks and applications. |
| | C404.2 | Analyse different compression techniques to compress audio and video. |
| | C404.3 | Analyse compression techniques required to compress text and image and gain knowledge of DMS |
| | C404.4 | Analyse compression techniques required to compress audio and video. |
| | C404.5 | Gain fundamental knowledge about multimedia communication across different networks |
| **Digital Signal Processing Algorithm & Architecture/15EC751/C405** | C405.1 | Describe the basics of DSP, multi rate sampling and architecture of DSP processor. |
| | C405.2 | Compare different DSP processor architectures and explain the architecture of TMS320C54XX |
| | C405.3 | Develop assembly language program using instruction set of TMS320C54XX. |
| | C405.4 | Design FIR, IIR, interpolation, decimation filter and FFT algorithms |
| | C405.5 | Design of external memory architecture for TMS320C54XX.. |
| **Advanced Communication Lab/15ECL76/ C406** | C406.1 | Determine the characteristics and response of microwave devices and optical wave-guide. |
| | C406.2 | Calculate the characteristics of microstrip antennas and compute the parameters associated with it. |
| | C406.3 | Make use of MATLAB to Simulate the digital modulation schemes to compute its performance parameters |
| | C406.4 | Design and test the digital modulation circuits/systems and display the waveforms |
| **VLSI Lab/15ECL77/ C407** | C407.1 | Design and simulate various digital circuits using CAD tool |
| | C407.2 | Analyze DC, AC and Transient characteristics for analog circuits. |
| | C407.3 | Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers. |
| | C407.4 | Design operational amplifier and analog/digital converters to meet desired parameters. |

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| | C407.5 | Design logic gates and shift registers and adders to meet desired parameters |
| **Project Work Phase –I/15ECP 78/ C408** | C408.1 | Identify, formulate and analyse engineering problems for the need of society. |
| | C408.2 | Design solutions for engineering problems using modern tool/technology to investigate with interpretation of data |
| | C408.3 | Analyse the impact of the engineering solutions in societal and environmental contexts for sustainable development with commit to professional ethics |
| | C408.4 | Work individually and in team, Communicate effectively through reports and presentations. |
| | C408.5 | Apply engineering, management and ethical principles for Project management and finance |
| **Wireless Cellular and LTE 4G Broadband/15EC81/ C409** | C409.1 | Model the system architecture and the functional standard specified in LTE 4G. |
| | C409.2 | Analyse the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users. |
| | C409.3 | Compare the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios. |
| | C409.4 | Examine the Performance of resource management and packet data processing and transport algorithms. |
| **Fiber Optics & Networks/15EC82/ C410** | C410.1 | Explain the classification and working of optical fiber with different modes of signal propagation |
| | C410.2 | Analyse the transmission characteristics and losses in optical fiber communication. |
| | C410.3 | Construct the features and the characteristics of optical sources and detectors. |
| | C410.4 | Describe the construction and working principle of optical connectors, multiplexers and amplifiers |
| | C410.5 | Illustrate the networking aspects of optical fiber and describe associated standards |
| **Machine learning/15EC 834/ C411** | C411.1 | Explain the core concepts of Machine Learning |
| | C411.2 | Apply decision tree algorithm |

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| | C411.3 | Acquire knowledge and Apply neural networks, Bayesian techniques and instant based learning algorithms |
| | C411.4 | Apply analytical learning and reinforcement learning algorithms |
| **Network and Cyber security/15EC835/C412** | C412.1 | Apply network security protocols. |
| | C412.2 | Make use of the basic concepts of cyber security |
| | C412.3 | Identify the cyber security problems |
| | C412.4 | Describe Enterprise Security Framework |
| | C412.5 | Apply concept of cyber security framework in computer system administration |
| **Intern ship /Professional Practice/15EC84/ C413** | C413.1 | Apply gained knowledge and skills in engineering practice. |
| | C413.2 | Analyse and design solutions for engineering problems. |
| | C413.3 | Work individually, in team and communicate effectively through reports and presentations. |
| | C413.4 | Demonstrate and adapt to workplace attitude and ethics. |
| **Project Work/15ECP 85/ C414** | C414.1 | Identify, formulate and analyse engineering problems for the need of society. |
| | C414.2 | Design solutions for engineering problems using modern tool/technology to investigate with interpretation of data. |
| | C414.3 | Analyse the impact of the engineering solutions in societal and environmental contexts for sustainable development with commit to professional ethics |
| | C414.4 | Work individually and in team, Communicate effectively through reports and presentations. |
| | C414.5 | Apply engineering, management and ethical principles for Project management and finance. |
| **Seminar/15ECS86/ C415** | C415.1 | Identify and explore recent trends in Electronics and Communication Engineering. |
| | C415.2 | Prepare effective report on the selected topic. |
| | C415.3 | Prepare Power point presentation (PPT), Communicate and answer the queries. |

# Sapthagiri College of Engineering

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## Department of Electronics & Communication Engineering


### Course Outcomes-Program Outcomes Mapping (2015-2019 Batch)

| Subject Name / Subject code/ Course code | Course Outcome Number | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENGINEERING MATHEMATICS – I/15MAT11/C101 | C101.1 | 3 | 1 | - | - | - | - | - | - | - | - | - | 1 |
| | C101.2 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C101.3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 1 |
| | C101.4 | 3 | 1 | - | - | - | - | - | - | - | - | - | 1 |
| | C101.5 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| ENGINEERING PHYSICS/15PHY12/C102 | C102.1 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |
| | C102.2 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |
| | C102.3 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |
| | C102.4 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |
| | C102.5 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |

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| | C102.6 | 2 | 1 | - | - | - | - | - | - | - | 1 | - | 1 |
| ELEMENTS OF CIVIL ENGINEERING AND MECHANICS/15CIV13/C103 | C103.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | - |
| | C103.2 | 3 | 2 | - | - | - | - | - | - | - | - | - | - |
| | C103.3 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| | C103.4 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| | C103.5 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| ELEMENTS OF MECHANICAL ENGINEERING/15EME14/C104 | C104.1 | 3 | 2 | - | - | - | - | 2 | - | - | - | - | 2 |
| | C104.2 | 3 | 2 | - | - | - | - | 2 | - | - | - | - | 2 |
| | C104.3 | 3 | - | - | - | - | - | - | - | - | - | - | 2 |
| | C104.4 | 3 | - | - | - | - | - | - | - | - | - | - | 2 |
| | C104.5 | 3 | 2 | - | - | - | - | 1 | - | - | - | - | 2 |
| BASIC ELECTRICAL ENGINEERING/15ELE15/C105 | C105.1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - |
| | C105.2 | 1 | 1 | - | - | - | 1 | - | - | - | - | - | - |
| | C105.3 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |

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| | C105.4 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |
| WORKSHOP LAB/15WSL16/C106 | C106.1 | - | - | - | - | - | - | - | - | 2 | 2 | - | 2 |
| | C106.2 | - | - | - | - | - | - | - | - | 2 | 2 | - | 2 |
| | C106.3 | - | - | - | - | - | - | 2 | - | 2 | 2 | - | 3 |
| ENGINEERING PHYSICS LAB/15PHYL17/C107 | C107.1 | 2 | 2 | - | - | - | 1 | - | - | 2 | 2 | - | 1 |
| | C107.2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | - | 1 |
| | C107.3 | 2 | 1 | - | - | - | 2 | - | - | 3 | 2 | - | 1 |
| | C107.4 | 1 | - | - | - | - | - | - | - | 2 | 2 | - | 1 |
| | C107.5 | 2 | 1 | - | - | - | - | - | - | 2 | 2 | - | 1 |
| ENGINEERING MATHEMATICS – II/15MAT21/C108 | C108.1 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C108.2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C108.3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C108.4 | 1 | - | - | - | - | - | - | - | - | - | - | - |
| | C108.5 | 2 | - | - | - | - | - | - | - | - | - | - | 1 |

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| ENGINEERING CHEMISTRY/15CHE22/C109 | C109.1 | 3 | - | - | - | - | | 2 | - | - | - | - | 2 |
| | C109.2 | 3 | - | - | - | - | | 2 | - | - | - | 2 | 2 |
| | C109.3 | 3 | 3 | - | - | - | 2 | 2 | - | - | - | 2 | 2 |
| | C109.4 | 3 | - | - | - | - | - | - | - | - | - | - | 2 |
| | C109.5 | 3 | - | - | - | - | - | 2 | - | - | - | - | 2 |
| C PROGRAMMING FOR PROBLEM SOLVING/15PCD23/C110 | C110.1 | 2 | - | - | - | - | - | - | - | - | - | - | 1 |
| | C110.2 | 2 | - | - | - | - | - | - | - | - | - | - | 1 |
| | C110.3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 |
| | C110.4 | 3 | 1 | - | - | - | - | - | - | - | - | - | 2 |
| | C110.5 | 3 | - | - | - | - | - | - | - | - | - | - | 2 |
| COMPUTER AIDED ENGINEERING DRAWING/15CE24/C111 | C111.1 | 2 | - | - | - | 3 | - | - | - | - | 3 | - | 3 |
| | C111.2 | 3 | 2 | - | - | 3 | - | - | - | - | 3 | - | 3 |
| | C111.3 | 3 | 2 | - | - | 3 | - | - | - | - | 3 | - | 3 |
| BASIC ELECTRONICS/15ELN25/C112 | C112.1 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | |

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| | C112.2 | 3 | 2 | 2 | - | - | - | - | - | - | | - | 1 |
| | C112.3 | 2 | 2 | 3 | - | | - | - | - | - | - | - | 1 |
| | C112.4 | 2 | 3 | | - | - | - | - | - | - | - | - | 1 |
| | C112.5 | 2 | 3 | | - | - | - | - | - | - | - | - | 1 |
| COMPUTER PROGRAMMING LABORATORY/15CPL26/C113 | C113.1 | 2 | - | - | - | - | - | - | - | - | - | - | 1 |
| | C113.2 | 2 | - | - | - | - | - | - | - | - | - | - | 1 |
| | C113.3 | 2 | 1 | - | - | - | - | - | - | - | - | - | 1 |
| | C113.4 | 3 | 1 | - | - | - | - | - | - | - | - | - | 2 |
| ENGINEERING CHEMISTRY LAB/15CHEL27/C114 | C114.1 | 3 | 2 | - | - | - | - | 2 | - | - | - | - | - |
| | C114.2 | 3 | 2 | - | - | - | - | 2 | - | - | - | - | - |
| | C114.3 | 3 | 2 | - | - | - | - | 2 | - | - | - | - | - |
| | C114.4 | 3 | 2 | - | - | - | - | 2 | - | - | - | - | - |
| | C114.5 | 3 | 2 | - | - | - | - | 2 | - | - | - | - | - |
| ENVIRONMENTAL | C115.1 | - | - | - | - | - | 3 | 3 | 2 | - | - | - | 2 |

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| STUDIES/17CIV28/C115 | C115.2 | 3 | - | - | - | - | 3 | 3 | 2 | - | - | - | 2 |
| | C115.3 | 3 | - | - | - | - | 3 | 3 | 2 | - | - | - | 2 |
| | C115.4 | 3 | - | - | - | - | 3 | 3 | 2 | - | - | - | 2 |
| ENGINEERING MATHEMATICS – III/15MAT 31/C201 | C201.1 | 3 | 2 | | | | | | | | | | 2 |
| | C201.2 | 3 | 2 | | | | | | | | | | 2 |
| | C201.3 | 3 | 2 | | | | | | | | | | 2 |
| | C201.4 | 3 | 1 | | | | | | | | | | 2 |
| | C201.5 | 3 | 2 | | | | | | | | | | 2 |
| | C201.6 | 2 | 2 | | | | | | | | | | 2 |
| ANALOG ELECTRONICS/15EC32/ C202 | C202.1 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C202.2 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C202.3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C202.4 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C202.5 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |

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| DIGITAL ELECTRONICS/15EC33 / C203 | C203.1 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 3 |
| | C203.2 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 3 |
| | C203.3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 3 |
| NETWORK ANALYSIS/15EC34/ C204 | C204.1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - |
| | C204.2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - |
| | C204.3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - |
| | C204.4 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - |
| ELECTRONIC INSTRUMENTATION/15EC35/ C205 | C205.1 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C205.2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C205.3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C205.4 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C205.5 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| ENGINEERING | C206.1 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |

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| ELECTROMAGNETICS/15EC36/ C206 | C206.2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C206.3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C206.4 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| ANALOG ELECTRONICS LAB/15ECL37/ C207 | C207.1 | - | 2 | 3 | 3 | - | - | - | - | 3 | 3 | - | 3 |
| | C207.2 | - | 2 | 3 | 3 | - | - | - | - | 3 | 3 | - | 3 |
| | C207.3 | - | 2 | 3 | 3 | - | - | - | - | 3 | 3 | - | 3 |
| | C207.4 | - | 2 | 3 | 3 | - | - | - | - | 3 | 3 | - | 3 |
| | C207.5 | - | 2 | 3 | 3 | - | - | - | - | 3 | 3 | - | 3 |
| DIGITAL ELECTRONICS LAB/15ECL38/C208 | C208.1 | - | - | - | - | - | - | - | - | 3 | 3 | - | 2 |
| | C208.2 | - | 2 | 3 | 3 | - | - | - | - | 3 | 3 | - | 2 |
| | C208.3 | - | 2 | 3 | 3 | - | - | - | - | 3 | 3 | - | 2 |
| | C208.4 | 3 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 2 |
| ENGINEERING MATHEMATICS – IV/15MAT41/ C209 | C209.1 | 3 | 2 | | | | | | | | | | 2 |
| | C209.2 | 3 | 1 | | | | | | | | | | 2 |

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| | C209.3 | 3 | 1 | | | | | | | | | | 2 |
| | C209.4 | 3 | 2 | | | | | | | | | | 2 |
| | C209.5 | 3 | 2 | | | | | | | | | | 2 |
| MICROPROCESSOR/15EC42 / C210 | C210.1 | 3 | - | - | - | - | - | - | - | - | 1 | 2 | 3 |
| | C210.2 | 3 | 3 | 3 | - | - | - | - | - | - | 1 | 2 | 3 |
| | C210.3 | 3 | 3 | 3 | - | - | - | - | - | - | 1 | 2 | 3 |
| | C210.4 | - | 3 | - | - | - | - | - | - | - | 1 | 2 | 3 |
| | C210.5 | 3 | 3 | 3 | - | - | - | - | - | - | 1 | 2 | 3 |
| CONTROL SYSTEMS/15EC43/ C211 | C211.1 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C211.2 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C211.3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C211.4 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 2 |
| | C211.5 | 2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 2 |
| SIGNALS AND SYSTEMS/15EC44/ | C212.1 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |

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| C212 | C212.2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C212.3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C212.4 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C212.5 | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | 2 |
| PRINCIPLES OF COMMUNICATION SYSTEMS/15EC45/ C213 | C213.1 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C213.2 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C213.3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C213.4 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C213.5 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| LINEAR INTEGRATED CIRCUITS/15EC46/C214 | C214.1 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C214.2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C214.3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C214.4 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C214.5 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C215.1 | - | 2 | 3 | - | 3 | - | - | - | 3 | 3 | 2 | 3 |

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| MICROPROCESSOR LAB/15ECL47/ C215 | C215.2 | - | 2 | 3 | - | 3 | - | - | - | 3 | 3 | 2 | 3 |
| | C215.3 | - | 2 | 3 | - | 3 | - | - | - | 3 | 3 | 2 | 3 |
| | C215.4 | - | 2 | 3 | - | 3 | - | - | - | 3 | 3 | 2 | 3 |
| | C215.5 | - | 2 | 3 | - | 3 | - | - | - | 3 | 3 | 2 | 3 |
| LINEAR ICS AND COMMUNICATION LAB/15ECL48/ C216 | C216.1 | - | 2 | 3 | 3 | | | | - | 3 | 3 | - | 2 |
| | C216.2 | - | 2 | 3 | 3 | | | | - | 3 | 3 | - | 2 |
| | C216.3 | - | 2 | 3 | 3 | | | | - | 3 | 3 | - | 2 |
| | C216.4 | - | 2 | 3 | 3 | | | | - | 3 | 3 | - | 2 |
| | C216.5 | - | 2 | 3 | 3 | | | | - | 3 | 3 | - | 2 |
| MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT/15ES51/C301 | C301.1 | - | - | - | - | - | 3 | - | 3 | 3 | 2 | 3 | 3 |
| | C301.2 | - | - | - | - | - | 3 | - | 3 | 3 | 3 | 3 | 3 |
| | C301.3 | - | - | - | - | - | 3 | - | 3 | 3 | 2 | 3 | 3 |
| | C301.4 | - | - | - | - | - | 3 | - | 3 | - | 2 | 3 | 3 |
| | C301.5 | - | - | - | - | - | 3 | - | 3 | 3 | 3 | 3 | 3 |

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| DIGITAL SIGNAL PROCESSING/15EC52/ C302 | C302.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C302.2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C302.3 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C302.4 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 |
| VERILOG HDL/15EC53/ C303 | C303.1 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| | C303.2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C303.3 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C303.4 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| INFORMATION THEORY & CODING/15EC54/C304 | C304.1 | 3 | 3 | 3 | | | | | | | - | | - |
| | C304.2 | 3 | 3 | 3 | 2 | | | | | | - | | - |
| | C304.3 | 3 | 3 | 3 | | | | | | | - | - | - |
| | C304.4 | 3 | 3 | 3 | 2 | | | | | | - | - | - |
| OPERATING SYSTEM/15EC553/ C305 | C305.1 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | C305.2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C305.3 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | C305.4 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 |
| | C305.5 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 |
| OBJECT ORIENTED PROGRAMMING USING C++/15EC 562/ C306 | C306.1 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| | C306.2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C306.3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| 8051 MICROCONTROLLER/15EC563/ C307 | C307.1 | 3 | 3 | | | | | | | | | | 2 |
| | C307.2 | 3 | 3 | | | | | | | | | | 2 |
| | C307.3 | 3 | 3 | | | | | | | | | | 2 |
| | C307.4 | 3 | 3 | | | | | | | | | | 2 |
| | C307.5 | 3 | 3 | | | | | | | | | | 2 |
| DSP LAB/15ECL57/ C308 | C308.1 | 3 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C308.2 | 3 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C308.3 | 3 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |

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| | C308.4 | 3 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| HDL LAB/15ECL58/C309 | C309.1 | - | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C309.2 | - | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C309.3 | - | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C309.4 | - | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| DIGITAL COMMUNICATION/15EC61/ C310 | C310.1 | 2 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C310.2 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C310.3 | 2 | 3 | 3 | - | | - | - | - | - | - | - | 2 |
| | C310.4 | 2 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C310.5 | 2 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| ARM MICROCONTROLLER & EMBEDDED SYSTEMS/15EC62/ C311 | C311.1 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | C311.2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 |
| | C311.3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 |
| | C311.4 | 2 | 3 | - | - | - | - | - | - | - | - | - | 3 |

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| | | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 |
| VLSI DESIGN/15EC63/C312 | C312.1 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C312.2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 |
| | C312.3 | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 2 |
| | C312.4 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 1 | 2 |
| | C312.5 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| COMPUTER COMMUNICATION NETWORKS/15EC64/ C313 | C313.1 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C313.2 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| | C313.3 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| | C313.4 | 3 | 3 | - | - | - | - | - | - | - | - | - | 2 |
| CELLULAR MOBILE COMMUNICATION/15EC651/C314 | C314.1 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C314.2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C314.3 | 2 | 2 | - | - | - | 1 | - | - | - | - | - | 2 |
| | C314.4 | 2 | 3 | - | - | - | - | - | - | - | - | - | 2 |

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| | C314.5 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| DIGITAL SWITCHING SYSTEMS/15EC654/ C315 | C315.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C315.2 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C315.3 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C315.4 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| DIGITAL SYSTEM DESIGN USING VERILOG/15EC663/ C316 | C316.1 | 2 | 2 | - | | | | | | | - | | 3 |
| | C316.2 | 3 | 3 | 3 | - | | | | | | - | | 3 |
| | C316.3 | 3 | 3 | 3 | - | | | | | | - | | 3 |
| | C316.4 | 2 | - | - | | | | | | | - | | 3 |
| | C316.5 | 2 | 3 | - | | | | | | | - | | 3 |
| EMBEDDED CONTROLLER LAB/15ECL67/C317 | C317.1 | - | - | 3 | 2 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C317.2 | 3 | 3 | 3 | 2 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C317.3 | 3 | 3 | 3 | 2 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C317.4 | 3 | 3 | 3 | 2 | 3 | - | - | - | 3 | 3 | - | 3 |

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| | C317.5 | - | - | 3 | 2 | 3 | - | - | - | 3 | 3 | - | 3 |
| COMPUTER NETWORKS LAB/15ECL68/ C318 | C318.1 | 3 | - | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 2 |
| | 318.2 | 3 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 2 |
| | 318.3 | 3 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 2 |
| | 318.4 | 3 | - | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 2 |
| MICROWAVE AND ANTENNAS/15EC71/ C401 | C401.1 | 2 | 2 | - | - | - | - | 2 | - | - | - | - | 2 |
| | C401.2 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | - | 2 |
| | C401.3 | 2 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C401.4 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C401.5 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| DIGITAL IMAGE PROCESSING/15EC72/C402 | C402.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C402.2 | 3 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 |
| | C402.3 | 2 | 2 | - | - | - | - | - | - | - | - | 2 | 2 |
| | C402.4 | 3 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 |

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| | C402.5 | 3 | 2 | - | - | - | - | - | - | - | - | 2 | 2 |
| POWER ELECTRONICS/15EC73/ C403 | C403.1 | 3 | - | 2 | - | - | - | - | - | - | - | - | 2 |
| | C403.2 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C403.3 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C403.4 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C403.5 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| MULTIMEDIA COMMUNICATION/15EC 741/ C404 | C404.1 | 2 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C404.2 | 2 | 3 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C404.3 | 2 | 3 | 3 | - | - | - | - | - | - | - | 2 | 2 |
| | C404.4 | 2 | 3 | 3 | - | - | - | - | - | - | - | 2 | 2 |
| | C404.5 | - | - | - | - | - | - | - | - | - | - | - | 2 |
| DIGITAL SIGNAL PROCESSING ALGORITHM & ARCHITECTURE/15EC751/C405 | C405.1 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| | C405.2 | 2 | 2 | - | - | - | - | - | - | - | - | - | 3 |
| | C405.3 | 3 | 3 | 3 | - | | - | - | - | - | - | - | 3 |
| | C405.4 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 |

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| | C405.5 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 |
| ADVANCED COMMUNICATION LAB/15ECL76/ C406 | C406.1 | - | - | 2 | 3 | - | - | 2 | - | 3 | 3 | - | 3 |
| | C406.2 | - | - | 2 | 3 | - | - | 2 | - | 3 | 3 | - | 3 |
| | C406.3 | 3 | 3 | 3 | 3 | 3 | - | - | - | 3 | 3 | - | 3 |
| | C406.4 | - | 3 | 3 | 3 | - | - | - | - | 3 | 3 | - | 3 |
| VLSI LAB/15ECL77/ C407 | C407.1 | 2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | 1 | 2 |
| | C407.2 | 2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | 1 | 2 |
| | C407.3 | 2 | - | 3 | 3 | 3 | - | - | - | 3 | 3 | 1 | 2 |
| | C407.4 | 2 | - | 3 | 3 | 3 | - | - | - | 3 | 3 | 1 | 2 |
| | C407.5 | 2 | 2 | 3 | 3 | 3 | - | - | - | 3 | 3 | 1 | 2 |
| PROJECT WORK PHASE –I/15ECP 78/ C408 | C408.1 | 3 | 3 | - | 3 | - | 2 | 1 | - | - | - | - | 3 |
| | C408.2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | 3 |
| | C408.3 | 3 | 3 | - | 3 | - | 2 | 1 | - | - | - | - | 3 |
| | C408.4 | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 |
| | C408.5 | 3 | - | - | - | - | - | - | 3 | - | - | 3 | 3 |

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| WIRELESS CELLULAR AND LTE 4G BROADBAND/15EC81/ C409 | C409.1 | 3 | | | - | - | - | - | - | - | | | 3 |
| | C409.2 | 3 | 3 | | - | - | - | - | - | - | | | 3 |
| | C409.3 | 2 | 3 | | - | - | - | - | - | - | | | 3 |
| | C409.4 | 3 | 3 | - | | - | - | - | - | - | | | 3 |
| FIBER OPTICS & NETWORKS/15EC82/ C410 | C410.1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 2 |
| | C410.2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 2 |
| | C410.3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 2 |
| | C410.4 | 2 | - | - | - | - | - | - | - | - | - | - | 2 |
| | C410.5 | 2 | - | - | - | - | - | - | - | - | - | - | 2 |
| MACHINE LEARNING/15EC 834/ C411 | C411.1 | 2 | - | - | - | - | - | - | - | - | - | 2 | 3 |
| | C411.2 | 3 | 3 | 3 | - | - | - | - | - | - | - | 2 | 3 |
| | C411.3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 2 | 3 |
| | C411.4 | 3 | 3 | 2 | 2 | - | - | - | - | - | - | 2 | 3 |
| NETWORK AND CYBER | C412.1 | 3 | - | | - | - | 3 | - | - | - | - | - | 3 |

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| SECURITY/15EC835/C412 | C412.2 | 3 | - | - | - | - | 3 | - | - | - | - | - | 3 |
| | C412.3 | 3 | - | - | | - | 3 | - | - | - | - | - | 3 |
| | C412.4 | - | - | - | - | - | 3 | - | - | - | - | - | 3 |
| | C412.5 | 3 | - | - | - | - | 3 | - | - | - | - | - | 3 |
| INTERN SHIP /PROFESSIONAL PRACTICE/15EC84/ C413 | C413.1 | 3 | 3 | 3 | 3 | - | 2 | 1 | - | - | - | - | 3 |
| | C413.2 | 3 | 3 | 3 | 3 | 2 | 2 | - | - | - | - | 2 | 3 |
| | C413.3 | - | - | - | - | - | - | - | 3 | 3 | 3 | - | 3 |
| | C413.4 | - | - | - | - | - | - | - | 3 | 3 | - | 2 | 3 |
| PROJECT WORK/15ECP 85/ C414 | C414.1 | 3 | 3 | - | 3 | - | 2 | 1 | - | - | - | - | 3 |
| | C414.2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | - | - | - | - | 3 |
| | C414.3 | 3 | 3 | - | 3 | - | 2 | 1 | - | - | - | - | 3 |
| | C414.4 | - | - | - | - | - | - | - | - | 3 | 3 | - | 3 |
| | C414.5 | 3 | - | - | - | - | - | - | 3 | - | - | 3 | 3 |
| | C415.1 | 3 | 3 | - | 3 | 3 | 1 | 1 | 3 | 3 | 3 | - | 3 |

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| SEMINAR/15ECS86/ C415 | C415.2 | - | - | - | - | 3 | - | - | 3 | 3 | 3 | - | 3 |
| | C415.3 | - | - | - | - | 3 | - | - | 3 | 3 | 3 | - | 3 |

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## Department of Electronics & Communication Engineering


| Subject Name / Subject code/ Course code | Course Outcome Number | PSO1 | PSO2 |
|---|---|---|---|
| ENGINEERING MATHEMATICS – I/15MAT11/C101 | C101.1 | - | 2 |
| | C101.2 | - | 2 |
| | C101.3 | - | 2 |
| | C101.4 | - | 2 |
| | C101.5 | - | 2 |
| ENGINEERING PHYSICS/15PHY12/C102 | C102.1 | - | - |
| | C102.2 | - | - |
| | C102.3 | - | - |
| | C102.4 | - | - |
| | C102.5 | - | - |

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| | C102.6 | - | - |
| ELEMENTS OF CIVIL ENGINEERING AND MECHANICS/15CIV13/C103 | C103.1 | - | - |
| | C103.2 | - | - |
| | C103.3 | - | - |
| | C103.4 | - | - |
| | C103.5 | - | - |
| ELEMENTS OF MECHANICAL ENGINEERING/15EME14/C104 | C104.1 | - | - |
| | C104.2 | - | - |
| | C104.3 | - | - |
| | C104.4 | - | - |
| | C104.5 | - | - |
| BASIC ELECTRICAL ENGINEERING/15ELE15/C105 | C105.1 | 1 | - |
| | C105.2 | 1 | - |
| | C105.3 | 1 | - |

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| | C105.4 | 1 | - |
| WORKSHOP LAB/15WSL16/C106 | C106.1 | - | - |
| | C106.2 | - | - |
| | C106.3 | - | - |
| ENGINEERING PHYSICS LAB/15PHYL17/C107 | C107.1 | - | - |
| | C107.2 | - | - |
| | C107.3 | - | - |
| | C107.4 | - | - |
| | C107.5 | - | - |
| ENGINEERING MATHEMATICS – II/15MAT21/C108 | C108.1 | - | 2 |
| | C108.2 | - | 2 |
| | C108.3 | - | 2 |
| | C108.4 | - | 1 |
| | C108.5 | - | 1 |

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| ENGINEERING CHEMISTRY/15CHE22/C109 | C109.1 | - | - |
| | C109.2 | - | - |
| | C109.3 | - | - |
| | C109.4 | - | - |
| | C109.5 | - | - |
| C PROGRAMMING FOR PROBLEM SOLVING/15PCD23/C110 | C110.1 | - | 1 |
| | C110.2 | - | 1 |
| | C110.3 | - | 1 |
| | C110.4 | - | 1 |
| | C110.5 | - | 1 |
| COMPUTER AIDED ENGINEERING DRAWING/15CE24/C111 | C111.1 | - | - |
| | C111.2 | - | - |
| | C111.3 | - | - |
| BASIC ELECTRONICS/15ELN25/C112 | C112.1 | 1 | - |

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| | C112.2 | 1 | - |
| | C112.3 | 1 | 1 |
| | C112.4 | 1 | - |
| | C112.5 | 1 | 1 |
| COMPUTER PROGRAMMING LABORATORY/15CPL26/C113 | C113.1 | - | 1 |
| | C113.2 | - | 1 |
| | C113.3 | - | 1 |
| | C113.4 | - | 1 |
| ENGINEERING CHEMISTRY LAB/15CHEL27/C114 | C114.1 | - | - |
| | C114.2 | - | - |
| | C114.3 | - | - |
| | C114.4 | - | - |
| | C114.5 | - | - |
| ENVIRONMENTAL | C115.1 | - | - |

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| STUDIES/17CIV28/C115 | C115.2 | - | - |
| | C115.3 | - | - |
| | C115.4 | - | - |
| ENGINEERING MATHEMATICS – III/15MAT 31/C201 | C201.1 | - | 2 |
| | C201.2 | - | 2 |
| | C201.3 | - | - |
| | C201.4 | - | 2 |
| | C201.5 | - | 2 |
| | C201.6 | - | 1 |
| ANALOG ELECTRONICS/15EC32/ C202 | C202.1 | 3 | 1 |
| | C202.2 | 3 | 1 |
| | C202.3 | 3 | 1 |
| | C202.4 | 3 | 1 |
| | C202.5 | 3 | 1 |
| | C203.1 | 3 | 1 |

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| DIGITAL ELECTRONICS/15EC33 / C203 | C203.2 | 3 | 1 |
| | C203.3 | 3 | 1 |
| NETWORK ANALYSIS/15EC34/ C204 | C204.1 | 3 | 1 |
| | C204.2 | 3 | 1 |
| | C204.3 | 3 | 1 |
| | C204.4 | 3 | 1 |
| ELECTRONIC INSTRUMENTATION/15EC35/ C205 | C205.1 | 3 | - |
| | C205.2 | 3 | - |
| | C205.3 | 3 | - |
| | C205.4 | 3 | - |
| | C205.5 | 3 | 3 |
| ENGINEERING ELECTROMAGNETICS/15EC36/ C206 | C206.1 | 2 | 3 |
| | C206.2 | 2 | 3 |

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| | C206.3 | 2 | 3 |
| | C206.4 | 2 | 3 |
| ANALOG ELECTRONICS LAB/15ECL37/ C207 | C207.1 | 3 | 2 |
| | C207.2 | 3 | 2 |
| | C207.3 | 3 | 2 |
| | C207.4 | 3 | 2 |
| | C207.5 | 3 | 2 |
| DIGITAL ELECTRONICS LAB/15ECL38/C208 | C208.1 | 3 | 3 |
| | C208.2 | 3 | 3 |
| | C208.3 | 3 | 3 |
| | C208.4 | 3 | 3 |
| ENGINEERING MATHEMATICS – IV/15MAT41/ C209 | C209.1 | - | 2 |
| | C209.2 | - | 1 |
| | C209.3 | - | 2 |

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| | C209.4 | - | 2 |
| | C209.5 | - | 2 |
| MICROPROCESSOR/15EC42 / C210 | C210.1 | 3 | - |
| | C210.2 | 3 | - |
| | C210.3 | 3 | - |
| | C210.4 | 3 | - |
| | C210.5 | 3 | - |
| CONTROL SYSTEMS/15EC43/ C211 | C211.1 | 2 | - |
| | C211.2 | 2 | - |
| | C211.3 | 2 | - |
| | C211.4 | 2 | - |
| | C211.5 | 2 | - |
| SIGNALS AND SYSTEMS/15EC44/ C212 | C212.1 | 2 | 2 |
| | C212.2 | 2 | 2 |

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| | C212.3 | 2 | 2 |
| | C212.4 | 2 | 2 |
| | C212.5 | 2 | 2 |
| PRINCIPLES OF COMMUNICATION SYSTEMS/15EC45/ C213 | C213.1 | 1 | 3 |
| | C213.2 | 1 | 3 |
| | C213.3 | 1 | 3 |
| | C213.4 | 1 | 3 |
| | C213.5 | 1 | 3 |
| LINEAR INTEGRATED CIRCUITS/15EC46/C214 | C214.1 | 3 | 1 |
| | C214.2 | 3 | 1 |
| | C214.3 | 3 | 1 |
| | C214.4 | 3 | 1 |
| | C214.5 | 3 | 1 |
| MICROPROCESSOR LAB/15ECL47/ | C215.1 | 3 | - |
| | C215.2 | 3 | - |

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| C215 | C215.3 | 3 | - |
| | C215.4 | 3 | - |
| | C215.5 | 3 | - |
| LINEAR ICS AND COMMUNICATION LAB/15ECL48/ C216 | C216.1 | 3 | - |
| | C216.2 | 3 | - |
| | C216.3 | 3 | 2 |
| | C216.4 | 3 | 2 |
| | C216.5 | 3 | - |
| MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT/15ES51/C301 | C301.1 | - | - |
| | C301.2 | - | - |
| | C301.3 | -- | - |
| | C301.4 | - | - |
| | C301.5 | - | - |
| DIGITAL SIGNAL | C302.1 | 2 | 3 |
| | C302.2 | 2 | 3 |

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| PROCESSING/15EC52/ C302 | C302.3 | 2 | 3 |
| | C302.4 | 2 | 3 |
| VERILOG HDL/15EC53/ C303 | C303.1 | 3 | - |
| | C303.2 | 3 | - |
| | C303.3 | 3 | - |
| | C303.4 | 3 | - |
| INFORMATION THEORY & CODING/15EC54/C304 | C304.1 | - | 3 |
| | C304.2 | - | 3 |
| | C304.3 | - | 3 |
| | C304.4 | - | 3 |
| OPERATING SYSTEM/15EC553/ C305 | C305.1 | 3 | - |
| | C305.2 | 3 | - |
| | C305.3 | 3 | - |
| | C305.4 | 3 | - |
| | C305.5 | 3 | - |

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| OBJECT ORIENTED PROGRAMMING USING C++/15EC 562/ C306 | C306.1 | 2 | - |
| | C306.2 | 2 | - |
| | C306.3 | 2 | - |
| 8051 MICROCONTROLLER/15EC563/ C307 | C307.1 | 2 | - |
| | C307.2 | 2 | - |
| | C307.3 | 2 | - |
| | C307.4 | 2 | - |
| | C307.5 | 2 | - |
| DSP LAB/15ECL57/ C308 | C308.1 | 3 | 3 |
| | C308.2 | 3 | 3 |
| | C308.3 | 3 | 3 |
| | C308.4 | 3 | 3 |
| | C309.1 | 3 | 2 |
| | C309.2 | 3 | 2 |

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| HDL LAB/15ECL58/C309 | C309.3 | 3 | 2 |
| | C309.4 | 3 | 2 |
| DIGITAL COMMUNICATION/15EC61/ C310 | C310.1 | - | 3 |
| | C310.2 | - | 3 |
| | C310.3 | - | 3 |
| | C310.4 | - | 3 |
| | C310.5 | - | 3 |
| ARM MICROCONTROLLER & EMBEDDED SYSTEMS/15EC62/ C311 | C311.1 | 3 | - |
| | C311.2 | 3 | - |
| | C311.3 | 3 | - |
| | C311.4 | 3 | - |
| | C311.5 | 3 | - |
| VLSI DESIGN/15EC63/C312 | C312.1 | 2 | - |
| | C312.2 | 2 | - |

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| | C312.3 | 2 | - |
| | C312.4 | 2 | - |
| | C312.5 | 2 | - |
| COMPUTER COMMUNICATION NETWORKS/15EC64/ C313 | C313.1 | - | 3 |
| | C313.2 | - | 3 |
| | C313.3 | - | 3 |
| | C313.4 | - | 3 |
| CELLULAR MOBILE COMMUNICATION/15EC651/C314 | C314.1 | - | 3 |
| | C314.2 | - | 3 |
| | C314.3 | - | 3 |
| | C314.4 | - | 3 |
| | C314.5 | - | 3 |
| DIGITAL SWITCHING SYSTEMS/15EC654/ C315 | C315.1 | - | 2 |
| | C315.2 | - | 2 |

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| | C315.3 | - | 2 |
| | C315.4 | - | 2 |
| DIGITAL SYSTEM DESIGN USING VERILOG/15EC663/ C316 | C316.1 | 3 | - |
| | C316.2 | 3 | - |
| | C316.3 | 3 | - |
| | C316.4 | 3 | - |
| | C316.5 | 3 | - |
| EMBEDDED CONTROLLER LAB/15ECL67/C317 | C317.1 | 3 | 1 |
| | C317.2 | 3 | 1 |
| | C317.3 | 3 | 1 |
| | C317.4 | 3 | 1 |
| | C317.5 | 3 | 1 |
| COMPUTER NETWORKS LAB/15ECL68/ C318 | C318.1 | - | 3 |
| | 318.2 | - | 3 |

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| | 318.3 | - | 3 |
| | 318.4 | - | 3 |
| MICROWAVE AND ANTENNAS/15EC71/ C401 | C401.1 | - | 3 |
| | C401.2 | - | 3 |
| | C401.3 | - | 3 |
| | C401.4 | - | 3 |
| | C401.5 | - | 3 |
| DIGITAL IMAGE PROCESSING/15EC72/C402 | C402.1 | 2 | - |
| | C402.2 | 2 | - |
| | C402.3 | 2 | - |
| | C402.4 | 2 | - |
| | C402.5 | 2 | - |
| POWER ELECTRONICS/15EC73/ C403 | C403.1 | 2 | - |
| | C403.2 | 2 | - |

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| | C403.3 | 2 | - |
| | C403.4 | 2 | - |
| | C403.5 | 2 | - |
| MULTIMEDIA COMMUNICATION/15EC 741/ C404 | C404.1 | - | 3 |
| | C404.2 | - | 3 |
| | C404.3 | - | 3 |
| | C404.4 | - | 3 |
| | C404.5 | - | 3 |
| DIGITAL SIGNAL PROCESSING ALGORITHM & ARCHITECTURE/15EC751/C405 | C405.1 | 2 | 2 |
| | C405.2 | 2 | 2 |
| | C405.3 | 2 | 2 |
| | C405.4 | 2 | 2 |
| | C405.5 | 2 | 2 |
| ADVANCED COMMUNICATION LAB/15ECL76/ C406 | C406.1 | - | 3 |
| | C406.2 | - | 3 |

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|---|---|---|---|
| | C406.3 | - | 3 |
| | C406.4 | - | 3 |
| VLSI LAB/15ECL77/ C407 | C407.1 | 3 | - |
| | C407.2 | 3 | - |
| | C407.3 | 3 | - |
| | C407.4 | 3 | - |
| | C407.5 | 3 | - |
| PROJECT WORK PHASE –I/15ECP 78/ C408 | C408.1 | 3 | 3 |
| | C408.2 | 3 | 3 |
| | C408.3 | 3 | 3 |
| | C408.4 | - | - |
| | C408.5 | - | - |
| WIRELESS CELLULAR AND LTE 4G BROADBAND/15EC81/ C409 | C409.1 | - | 3 |
| | C409.2 | - | 3 |
| | C409.3 | - | 3 |

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|---|---|---|---|
| | C409.4 | - | 3 |
| FIBER OPTICS & NETWORKS/15EC82/ C410 | C410.1 | - | 3 |
| | C410.2 | - | 3 |
| | C410.3 | 2 | 3 |
| | C410.4 | 2 | 3 |
| | C410.5 | 2 | 3 |
| MACHINE LEARNING/15EC 834/ C411 | C411.1 | 2 | - |
| | C411.2 | 2 | - |
| | C411.3 | 2 | - |
| | C411.4 | 2 | - |
| NETWORK AND CYBER SECURITY/15EC835/C412 | C412.1 | - | 3 |
| | C412.2 | - | 3 |
| | C412.3 | - | 3 |
| | C412.4 | - | 3 |

**Course Outcomes-Outcomes Mapping**

**Program Specific (2015-2019 Batch)**

| | | | |
|---|---|---|---|
| | C412.5 | - | 3 |
| INTERN SHIP /PROFESSIONAL PRACTICE/15EC84/ C413 | C413.1 | 2 | 2 |
| | C413.2 | 2 | 2 |
| | C413.3 | - | - |
| | C413.4 | - | - |
| PROJECT WORK/15ECP 85/ C414 | C414.1 | 3 | 3 |
| | C414.2 | 3 | 3 |
| | C414.3 | 3 | 3 |
| | C414.4 | - | - |
| | C414.5 | - | - |
| SEMINAR/15ECS86/ C415 | C415.1 | 3 | 3 |
| | C415.2 | 3 | 3 |
| | C415.3 | 3 | 3 |