BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
Department of Electrical & Electronics Engineering

COURSE OUTCOMES

R19 REGULATION
I YEAR I SEMESTER

CO CODE	COURSE OUTCOME	TAXONOMY LEVEL
COURSE NAME:ENGLISH- (C111)		
C111.1	Classify and compare different things and cultures and behaviours of people from generation to generation.	UNDERSTANDING
C111.2	Select an inspiring personality and to achieve the new heights in personal and professional life	APPLYING
C111.3	Apply Science and Technology to transform lives despite physical disabilities and to invent latest Engineering tools for the needs of the Society	APPLYING
C111.4	Actively take part in protecting environment and the rights of the underprivileged despite challenges in personal and public life.	ANALYSING
C111.5	Develop the spirit of inquisitiveness in the areas of interest chosen and to offer insight into how to lead a successful life	CREATING
COURSE NAME:MATHEMATICS-I (C112)		
C112.1	Utilize mean value theorems to related to various engineering fields	APPLYING
C112.2	Solve the first order differential equations and able to apply physical problems	APPLYING
C112.3	Solve higher order linear differential equations with constant coefficients	APPLYING
C112.4	Find the partial derivative of different orders, finding maxima and minima of function of two variable, three variables and functional dependence	EVALAUTING
C112.5	Apply double integration techniques in evaluating areas bounded by region and also learn important tools of calculus in higher dimensions like 2-dimensional and 3-dimensional coordinate systems.	APPLYING
COURSE NAME:APPLIED CHEMISTRY (C113)		
C113.1	Define composite plasticmaterials and study the mechanism of conduction in conducting polymers	UNDERSTANDING
C113.2	Classify different typesof electrodes and batteries for technological applications	REMEMBERING
C113.3	Summerize the importance of engineering materials like nano materials ,plastics and rubbers	UNDERSTANDING
C113.4	Explain various methods of preparation and applications of liquid crystals	UNDERSTANDING
C113.5	Explain various models for energy by different natural sources	UNDERSTANDING
COURSE NAME:PROGRAMMING FOR PROBLEM SOLVING USING C (C114)		
C114.1	Interpret and debug programs in C language, Demonstrate syntaxes, predefined functions and operators in computer programming languages	UNDERSTANDING
C114.2	Build C programs involving decision making statements, looping statements and understanding the control flow of the programs	APPLYING
C114.3	Examine Arrays, Strings and Develop C programs using String manipulation functions	APPLYING
C114.4	Design programs using pointers and dynamic memory management functions	CREATING
C114.5	Construct functions, create files and develop programs using file handling functions	CREATING
COURSE NAME: ENGINEERING DRAWING (C115)		
C115.1	Construct the basic curved profiles, types of scales for engineering application like maps, buildings, and bridges	CREATING
C115.2	Categories the projection of points and analyze the concept of projections involving points and lines along with traces	ANALYSING
C115.3	Analyze & identify the types of planes and the problems involving in projection of planes	ANALYSING
C115.4	Classify the types of solids ar.d analyze the concept of projection of solids involving multiple orientations with principle planes	ANALYSING
C115.5	Create the isometric projections by using orthographic projections and vice versa	CREATING

	COURSE NAME:ENGLISH LAB (C116)	
C116.1	Conduct Research in safe and Responsible manners communicating the environmental subject more effectively	APPLYING
C116.2	Classify the words properly into disyllables, polysyllables and pronounce them correctly while communicating with others	ANALYZING
C116.3	Apply the principles of rhythm and intonation to enhance the clarity and	APPLYING
C116.4	Analyze spoken sentences and identify the words or syllables that are	ANALYZING
C116.5	: Identify and differentiate between primary and secondary stress, stress in	APPLYING
	COURSE NAME: APPLIED CHEMISTRY LABORATORY(C117)	
C117.1	Develop better understanding of titration	APPLYING
C117.2	Explain the difference between Solubility and dissociation in water and apply this knowledge	UNDERSTANDING
C117.3	Estimate the hardness of water in terms of Calcium and Magnesium ions	EVALUATING
C117.4	Apply safety rules in practice of laboratory investigations	APPLYING
C117.5	Explain the different instrumental methods of chemical analysis	UNDERSTANDING
	COURSE NAME: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (C118)	
C118.1	Interpret and debug programs in C language, Demonstrate syntaxes, predefined functions and operators in computer programming languages	UNDERSTANDING
C118.2	Demonstrate C programs involving decision making statements, iterative statements and understanding the control flow of the programs	APPLYING
C118.3	Classify Arrays, Strings and Develop C programs using String manipulation functions	ANALYZING
C118.4	Design programs using pointers and dynamic memory management functions	CREATING
C118.5	Construct functions, create files and develop programs using file handling functions	CREATING
	COURSE NAME: ENVIRONMENTAL SCIENCE (C119)	
C119.1	Explain the eco system and it's function in the environment	UNDERSTANDING
C119.2	Aware the importance of natural resources and it's conversation	UNDERSTANDING
C119.3	Analyse the diversity of life on earth and it's importance	ANALYSING
C119.4	Execute different programmes in eco friendly	APPLYING
C119.5	Describe the different laws to protect our environment	ANALYSING
C119.6	Conduct Research in safe and Responsible manners communicating the environmental subject more effectively	APPLYING

I YEAR II SEMESTER

	COURSE NAME: MATHEMATICS-II (C121)	
C121.1	: Find Rank and Solve the linear system of equations by using different methods	APPLYING
C121.2	Find the inverse and power of a matrix by using Cayley Hamilton theorem. And alsodiagonalize the matrix by using various methods. Finding Rank, Index, Signature and Nature of a Quadratic form	APPLYING
C121.3	Solve the algebraic and transcendental equations by different methods	APPLYING
C121.4	Apply Newton's forward and back ward interpolation and Lagrange's formulae for equal and unequal intervals	APPLYING
C121.5	Find the Quadrature, the solutions of ordinary differential equations by different formulae	APPLYING
	COURSE NAME: MATHEMATICS-III(C122)	
C122.1	Utilize the vector differential operators (Gradient, Divergence and Curl) and Estimate the work done against a field, circulation and flux using vector	EVALUATING
C122.2	Solve the differential equations using Laplace transforms	APPLYING
C122.3	Find the Fourier series of periodic signals	APPLYING
C122.4	Able to form the PDE and identify the solutions of linear and non linear PDE	APPLYING
C122.5	Identify the solution methods for 2nd order partial differential equations representing physical problems	APPLYING

COURSE NAME: APPLIED PHYSICS (C123)		
C123.1	Explain concept of interference, Diffraction, resolving power of Microscope,Telescope and Grating	UNDERSTANDING
C123.2	Explain concept of Davisson Germer experiment ,G.P Thomson experiment and derive schrodinger wave equations	UNDERSTANDING
C123.3	Explain the concept of K-P model , classical and quantum free electron theories,effective mass of electron .	APPLYING
C123.4	Explain the concept of types of semiconductors, hall effect and drift,diffusion currents.	UNDERSTANDING
C123.5	Describe the concept of classification of magnetic materials,domain concept, Hysteresis-soft,hard magnetic materials and dielectric materials,types of polarization,Lorentz internal field and claussius - mossoti equation	ANALYZING
COURSE NAME:FUNDAMENTALS OF COMPUTERS (C124)		
C124.1	Illustrate input and output devices of Computers and how it works and recognize the basic terminology used in computer programming	UNDERSTANDING
C124.2	Apply the basic concepts of programming languagfor Problem Solving and Programming	APPLYING
C124.3	Illustrate the basic concepts of Computer networks, types of networks and topologies	UNDERSTANDING
C124.4	Illustrate the basic concepts of Databases and System design	UNDERSTANDING
C124.5	Illustrate Advanced Computer Technologies like Distributed Computing & Wireless Networks	UNDERSTANDING
COURSE NAME:ELECTRICAL CIRCUIT ANALYSIS-1(C125)		
C125.1	Apply the solution methods such as nodal analysis and mesh analysis	APPLYING
C125.2	Illustrate magnetic circuits concepts	ANALYZING
C125.3	Apply ac circuits concepts to find various performance parameters of electrical network	APPLYING
C125.4	Explain single phase circuit concepts to obtain locus diagrams and resonance	UNDERSTANDING
C125.5	Evaluate various networks by using principles of network theorems	EVALUATING
COURSE NAME:ELECTRICAL ENGINEERING WORKSHOP(C126)		
C126.1	Explain the limitations, tolerances, safety aspects of electrical systems and wiring	UNDERSTANDING
C126.2	Make simple lighting and power circuits	ANALYZING
C126.3	Measure current, voltage and power in a circuit	UNDERSTANDING
COURSE NAME::APPLIED PHYSICS LABORATORY(C127)		
C127.1	Apply the knowledge of interference ,determine wavelength of a source-diffraction grating,radius of curvature of plano convex lens using newton's rings	APPLYING
C127.2	Analyze the knowledge of semiconductors determine energy gap of p-n junction diode,study of B-H curve,Hall voltage and Hall coefficients	APPLYING
C127.3	Explain the resolving power of telescope , grating and dispersive power of diffraction grating	UNDERSTANDING
C127.4	Analyze the variation of dielectric constant with temperature and also explain dielectric constant by charging and discharging method	ANALYZING
C127.5	Analyze the characteristics of Thermistor- temperature coefficients	ANALYZING
COURSE NAME:COMMUNICATION SKILLS LABORATORY(C128)		
C128.1	Develop the skills and confidence to speak publicly, which is valuable in both personal and professional settings	UNDERSTANDING
C128.2	Apply the knowledge of telephonic interviews to get ready for them, establish a rapport with the interviewer, and build trust over the phone	APPLYING
C128.3	select a suitable presentation with proper presentational aids to present the information	APPLYING
C128.4	Analyze the given topic, share the opinions and act efficiently as an individual and team member in Group Discussion	ANALYZING
C128.5	Develop an idea about various kinds and stages of interviews to face interviews confidently	APPLYING

COURSE NAME: ENGINEERING EXPLORATION PROJECT (C129)		
C129.1	Student can able to identify and solve the issues related to electrical engineering by using engineering concepts	APPLYING
C129.2	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources	EVALUATING
C129.3	Student can apply and simulate the result by using different softwares or possible extend that result as a prototype	APPLYING
C129.4	Students able to use conventional and latest technologies and apply the knowledge acquireand solve the problems in their project work	APPLYING
C129.5	Compare the result of their work to improve the quality of work	EVALUATING

II YEAR I SEMESTER

COURSE NAME: ELECTRICAL CIRCUIT ANALYSIS-II (C211)		
C211.1	Solve the three-phase circuits under balanced load condition	APPLYING
C211.2	find the transient response of electrical networks for different types of excitations using Differential equations and Laplace Transforms	APPLYING
C211.3	find parameters for different types of network	ANALYZING
C211.4	realize electrical equivalent network for a given network transfer function	APPLYING
C211.5	Estimate different harmonics components from the response of an electrical network	EVALUATING
COURSE NAME:ELECTRICAL MACHINES-I(C212)		
C212.1	Assimilate the concepts of electromechanical energy conversion	ANALYSING
C212.2	Mitigate the ill-effects of armature reaction and improve commutation in dc machines	APPLYING
C212.3	Understand the torque production mechanism and control the speed of dc motors	UNDERSTANDING
C212.4	Analyse the performance of single-phase transformers	ANALYSING
C212.5	Predetermine regulation, losses, and efficiency of single-phase transformers.	ANALYSING
COURSE NAME: ELECTRONICS DEVICES & CIRCUITS (C213)		
C213.1	Students are able to understand the basic concepts of semiconductor physics, which are useful to understand the operation of diodes and transistors	REMEMBERING
C213.2	Students are able to demonstrate the operation and characteristics of PN junction diode and special diodes	UNDERSTANDING
C213.3	students are ability to understand operation and develop rectifiers and regulators	CREATING
C213.4	Students are able to analyze the characteristics of various transistor configurations and also compare the various configurations.	ANALYZING
C213.5	Students are able to explain the concepts of positive and negative feedback and also compare these feed backs, and also design baising	EVALUATING
COURSE NAME:ELECTROMAGNETIC FIELDS(C214)		
C214.1	Determine electric fields and potentials using Guass's law or solving Laplace's or Possion's Determine equations, for various electric charge distributions and calculate and design capacitance, energy stored in dielectrics.	CREATING
C214.2	Calculate the magnetic field intensity due to current, the application of Amper's law and the Maxwell's second and third equations.	EVALUATING
C214.3	Determine the magnetic forces and torque produced by currents in magnetic field.	EVALUATING
C214.4	Determine self and mutual inductances and the energy stored in the magnetic field.	ANALYZING
C214.5	Calculate induced EMF, understand the concepts of displacement current and Poynting vector.	EVALUATING
COURSE NAME: THERMAL & HYDRO PRIME MOVERS(C215)		
C215.1	Apply the Otto, diesel cycles for finding the performance of S.I and C.I engine	APPLYING
C215.2	Illustrate the steam formation and its utilities through the standard steam data tables	UNDERSTANDING
C215.3	Examine the simple gas turbine fundamentals and methods to improve the efficiency of gas turbines	ANALYZING
C215.4	Evaluate the performance characteristics of centrifugal and reciprocating pumps	EVALUATING
C215.5	compare the constructional features, operational details of various types of hydraulic turbines	UNDERSTANDING

	COURSE NAME:MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS(C216)	
C216.1	Define the fundamental concepts of managerial economics.	REMEMBERING
C216.2	Classify and compare various costs in managerial decision making process.	UNDERSTANDING
C216.3	Identify the features of different market structures and various forms of Business organisations	APPLYING
C216.4	Identify fundamental concepts of accounting and Analyze financial statements.	APPLYING
C216.5	Evaluate various alternative investment proposals to make a better capital budgeting decisio	EVALUATING
	COURSE NAME:: THERMAL AND HYDRO LABORATORY(C217)	
C217.1	Apply the Otto, diesel cycles for finding the performance of S.I andC.Iengine	APPLYING
C217.2	Illustrate the steam formation and its utilities through the standard steam data tables	UNDERSTANDING
C217.3	Examine the simple gas turbine fundamentals and methods to improve the efficiency of gas turbines	ANALYZING
C217.4	Evaluate the performance characteristics of centrifugal and reciprocating pumps	EVALUATING
C217.5	compare the constructional features, operational details of various types of hydraulic turbines	UNDERSTANDING
	COURSE NAME: ELECTRICAL CIRCUITS LABORATORY (C218)	
C218.1	Evaluate various networks by using principles of network theorems	EVALUATING
C218.2	Apply ac circuits concepts to find various performance parameters of electrical network	REMEMBERING
C218.3	Analyze magnetic circuits concepts	ANALYZING
C218.4	Explain single phase circuit concepts to obtain locus diagrams and resonance	UNDERSTANDING
C218.5	Find the parameters of a network based on input and Output excitation/response.	REMEMBERING
C218.6	Solve the three-phase circuits under unbalanced load condition	APPLYING
	COURSE NAME: ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE (C219)	
C219.1	Identify the concept of Traditional knowledge and its importance	APPLYING
C219.2	Explain the need and importance of protecting traditional knowledge.	UNDERSTANDING
C219.3	Illustrate the various enactments related to the protection of traditional knowledge.	UNDERSTANDING
C219.4	Interpret the concepts of Intellectual property to protect the traditional knowledge.	UNDERSTANDING
C219.5	Explain the importance of Traditional knowledge in Agriculture and Medicine.	UNDERSTANDING
	II YEAR II SEMESTER	
	COURSE NAME: ELECTRICAL MEASUREMENTS & INSTRUMENTATION (C221)	
C221.1	To study the principle of operation and working of different types of instruments for measurement of Electrical Quantities	REMEMBERING
C221.2	To study the working principle of operation of different types of instruments for measurement of power and power factor	REMEMBERING
C221.3	To understand the principle of operation and working of various types of bridges for measurement of parameters–resistance, inductance, capacitance and frequency	UNDERSTANDING
C221.4	To Understand The Principle Of Operation And Working Of Transducers	UNDERSTANDING
C221.5	To study the principle of operation and working of DVMS, Power analyzer and applications of CRO	REMEMBERING
	COURSE NAME: ELECTRICAL MACHINES-II (C222)	
C222.1	Understand the principle of operation and performance of 3-phase induction motor	UNDERSTANDING
C222.2	Quantify the performance of induction motor and induction generator in terms of torque and slip.	APPLYING
C222.3	Understand the torque producing mechanism of a single phase induction motor.	UNDERSTANDING
C222.4	Analyze the emf generation, and the effect of armature reaction and predetermination of voltage regulation in synchronous generators.	ANALYZING
C222.5	Study parallel operation and control of real and reactive powers for synchronous generators	ANALYZING
C222.6	Understand the operation,and analyze the performance and starting methods of synchronous motors.	ANALYZING

	COURSE NAME: DIGITAL ELECTRONICS (C223)	
C223.1	Classify different number systems and apply to generate various codes	APPLYING
C223.2	Apply the concept of Boolean algebra in minimization of switching functions	APPLYING
C223.3	Analyse different types of combinational logic circuits.	ANALYZING
C223.4	Apply knowledge of flip-flops in designing of Registers and counters	APPLYING
C223.5	Produce innovative designs by modifying the traditional design techniques.	DESIGNING
	COURSE NAME: CONTROL SYSTEMS (C224)	
C224.1	Model the transfer function of physical systems, determination of overall transfer function using block diagram algebra and signal flow graphs.	APPLYING
C224.2	Determine the time response specifications of second order systems and to estimate the error constants.	EVALUATING
C224.3	Analyze absolute stability and relative stability of LTI systems using Routs stability criterion	ANALYZING
C224.4	Analyze stability of LTI systems using frequency response methods.	ANALYZING
C224.5	Designing of Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram	CREATING
	COURSE NAME: POWER SYSTEMS-1 (C225)	
C225.1	Identify the different components of thermal power plants	APPLYING
C225.2	Identify the different components of nuclear Power plants	APPLYING
C225.3	Identify the different components of air and gas insulated substations	APPLYING
C225.4	Identify single core and three core cables with different insulating materials	APPLYING
C225.5	Analyse the different economic factors of power generation and tariffs	ANALYZING
	COURSE NAME:SIGNALS & SYSTEMS (C226)	
C226.1	Characterize the signals and systems and principles of vector spaces, Concept of orthgonality	ANALYZING
C226.2	Analyze the continuous-time signals and continuous-time systems using Fourier series, Fourier transform and Laplace transform	ANALYZING
C226.3	Apply sampling theorem to convert continuous-time signals to discrete-time signal and reconstruct back.	APPLYING
C226.4	Understand the relationships among the various representations of LTI systems.	UNDERSTANDING
C226.5	Understand the Concepts of convolution, correlation, Energy and Power density spectrum and their relationships. Analyze Discrete time systems using Z-transforms.	ANALYZING
	COURSE NAME: ELECTRICAL MACHINES-1 LABORATORY(C227)	
C227.1	To determine and predetermined the performance of DC machines andTransformers	APPLYING
C227.2	To conduct experiment to control the speed of DC motor	APPLYING
C227.3	To convert three phases- Two phase Transformation	UNDERSTANDING
C227.4	To study the load sharing by two parallel connected transformers	REMEMBERING
C227.5	To separate the losses in a DC shunt machine and single phase transformer.	ANALYZING
C227.6	draw the performance curves for DC machines.	REMEMBERING
	COURSE NAME: ELECTRONICS DEVICES & CIRCUITS LABORATORY(C228)	
C228.1	Explain about analog meters, digital meters, RPS, DMM and CRO	UNDERSTANDING
C228.2	Utilize the voltage and current relationships of PN Diode and Zener diode	APPLYING
C228.3	Construct and Develop efficiency and % regulations of Halfwave and Fullwave rectifiers with and without filters	APPLYING
C228.4	Identify and compare the characteristics of BJT, FET, SCR and UJT in different configurations	APPLYING
C228.5	Construct the different amplifier circuits for BJT and FET	APPLYING
	COURSE NAME: PROFESSIONAL ETHICS AND HUMAN VALUES (C229)	
C229.1	Define the basic insights and inputs to the student on ethics, values,morals,	REMEMBERING
C229.2	Explain the ethical responsibilities of engineers.	UNDERSTANDING
C229.3	Demonstrate the knowledge on engineering as a social experimentation.	UNDERSTANDING
C229.4	Create the awareness about safety,risk,risk benefit analysis.	CREATING
C229.5	Develop knowledge about global issues and environmental ethics .	CREATING

III YEAR I SEMESTER

COURSE NAME: POWER SYSTEMS-II (C311)

C311.1	Calculate parameters of transmission lines for different circuit configurations	EVALUATING
C311.2	Determine the performance of short, medium and long transmission lines	EVALUATING
C311.3	Analyze the effect of travelling waves on transmission lines	UNDERSTANDING
C311.4	Analyze the various voltage control methods and effect of corona	ANALYZING
C311.5	Calculate sag/tension of transmission lines and performance of line insulators	EVALUATING

COURSE NAME:POWER ELECTRONICS (C312)

C312.1	Explain the characteristics of various power semiconductor devices and analyze the static and dynamic characteristics of SCR's and design firing circuits for SCR.	DESINING
C312.2	Explain the operation of single phase full-wave converters and analyze harmonics in the input current.	ANALYZING
C312.3	Explain the operation of three phase full-wave converters.	ANALYZING
C312.4	Analyze the operation of different types of DC-DC converters.	ANALYZING
C312.5	Explain the operation of inverters and application of PWM techniques for voltage control and harmonic mitigation and analyze the operation of AC-AC regulators	ANALYZING

COURSE NAME: LINEAR IC APPLICATIONS (C313)

C313.1	Discuss types of Differential amplifier and analysis of AC & DC Differential amplifier	UNDERSTANDING
C313.2	Summarize functioning, parameters and Specifications and characteristics of IC 741	UNDERSTANDING
C313.3	Design the linear and non linear circuits by using Op-Amp	CREATING
C313.4	Design & analysis of types of filters both 1st order and 2nd order	ANALYZING
C313.5	Design the Multi vibrators by using IC555 & discuss the PLL & VCO Applications and different types of ADC & DAC and its specifications	CREATING

COURSE NAME: DIGITAL SIGNAL PROCESSING (C314)

C314.1	Analyse the Discrete Time Signals and Systems in Time and Frequency Domain and Review of Z-Transforms.	ANALYZING
C314.2	Examine the properties of Discrete Fourier Series and Discrete Fourier Transforms and Explain the linear filtering methods based on DFT and FFT algorithms.	APPLYING
C314.3	Illustrate the analog filter approximations techniques and various implementations of IIR digital filter structures.	APPLYING
C314.4	Determine the different window techniques and frequency sampling techniques of FIR digital filter	APPLYING
C314.5	Explain the the concepts of multiple sampling rates for DSP	UNDERSTANDING

COURSE NAME: MICRO PROCESSOR & MICRO CONTROLLERS (C315)

C315.1	Illustrate The 8086 Architecture and Register organization , Understand the Addressing modes and instrucion set	UNDERSTANDING
C315.2	Classify Minimum mode and maximum mode of 8086 and Understand the Various interfacing modules like 8255, ADC, DAC and Memory interacing With 8086	UNDERSTANDING
C315.3	Apply Various interfacing modules like 8251 Interfacing 8257, progamale interrupt controller and Key board/display controller interface with 8086	APPLYING
C315.4	Summarize The 8051 Micro Controller Architecture, timers, types of instructions and various modules.	UNDERSTANDING
C315.5	Illustrate The PIC, registers, serial IOs, architecture and understand the pic programming	UNDERSTANDING

COURSE NAME: ELECTRICAL MACHINES-II LAB (C316)

C316.1	Compute the Equivalent Circuit parameters of three phase & single phase Induction Motors	APPLYING
C316.2	Obtain the control of speed of three phase induction motor	APPLYING
C316.3	Predetermine the regulation of three phase alternator by various methods	APPLYING
C316.4	Determine the Xd/ Xq ratio of alternator and asses the performance of threephase synchronous motor.	EVALUATING
C316.5	Determine the performance single phase AC series motor.	EVALUATING

	COURSE NAME: CONTROL SYSTEMS LAB(C317)	
C317.1	Model the transfer function of physical systems, determination of overall transfer function using block diagram algebra and signal flow graphs.	APPLYING
C317.2	Determine the time response specifications of second order systems and to estimate the error constants	EVALUATING
C317.3	Designing the Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram	CREATING
	COURSE NAME: ELECTRICAL MEASUREMENTS& INSTRUMENATATION LABORATORY(C318)	
C318.1	To understand the correct function of electrical parameters and calibration of voltage, current, single phase and three phase power and energy, and measurement of electrical characteristics of resistance, inductance and capacitance of a circuits through appropriate methods	UNDERSTANDING
C318.2	To understand the calibration of DC and AC Potentiometers.	UNDERSTANDING
C318.3	To understand the testing of CT and PT	UNDERSTANDING
C318.4	To Understand and the characteristics of Thermo couples, LVDT, Capacitive transducer, piezoelectric transducer.	UNDERSTANDING
C318.5	To understand the measurement of strain, Phase difference and frequency	UNDERSTANDING
	COURSE NAME: SOCIALLY RELEVANT PROJECT (C319)	
C319.1	Student can able to identify and solve the issues related to technological problems of society	ANALYZING
C319.2	Student can able to suggest technological changes which suits current needs of society	UNDERSTANDING
C319.3	Students able to use conventional and latest technologies and apply the knowledge acquired to solve the problems of the society.	UNDERSTANDING
	III YEAR II SEMESTER	
	COURSE NAME:ELECTRIC DRIVES (C321)	
C321.1	Explain the fundamentals of electric drive and different electric braking methods	UNDERSTANDING
C321.2	Analyze the operation of three phase converter fed dc motors and four quadrant operations of dc motors using dual converters	ANALYZING
C321.3	Describe the converter control of dc motors in various quadrants of operation	UNDERSTANDING
C321.4	Explain the concept of speed control of induction motor by using AC voltage controllers and voltage source inverters.	UNDERSTANDING
C321.5	Differentiate the stator side control and rotor side control of three phase induction motor; explain the speed control mechanism of synchronous motors	ANALYZING
	COURSE NAME :POWER SYSTEM ANALYSIS (C322)	
C322.1	Develop impedance diagram for a power system network and calculate per unit quantities.	APPLYING
C322.2	Apply the load flow solution to a power system using different methods	APPLYING
C322.3	Develop Zbus for a power system networks and analyze the effect of symmetrical faults	ANALYZING
C322.4	Analyse the sequence components for power system Components and analyze its effects of unsymmetrical faults	ANALYZING
C322.5	Analyse the stability concepts of a power system.	ANALYZING
	COURSE NAME: DATA STRUCTURES (C323)	
C323.1	Describe various types of data structures and complexity notations. And interpret Arrays stack, queue operations and applications	UNDERSTANDING
C323.2	Evalute the given problem by choosing appropriate data structure	EVALUATING
C323.3	Create different trees like binary, threaded binary, heap etc	CREATING
C323.4	Analyze different paths algorithms related to the issue of how to find a shortest path with minimum cost	ANALYZING
C323.5	Implement various sorting and searching techniques.	CREATING

COURSE NAME: DIGITAL CONTROL SYSTEMS (C324)		
C324.1	Model the transfer function of physical systems, determination of overall transfer function using block diagram algebra and signal flow graphs	APPLYING
C324.2	Determine the time response specifications of second order systems and to estimate the error constants.	EVALUATING
C324.3	Analyze absolute stability and relative stability of LTI systems using Routs stability criterion and root locus method	ANALYZING
C324.4	Analyze stability of LTI systems using frequency response methods	ANALYZING
C324.5	Designing of Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram	CREATING
COURSE NAME: INTERNET OF THINGS APPLICATIONS TO ELECTRICAL ENGINEERING (C325)		
C325.1	Know the various fundamentals, architectures and technologies of Internet of Things	UNDERSTANDING
C325.2	Understand various communication technologies used in the Internet of Things	UNDERSTANDING
C325.3	Understand the various device connectivity methods using web and internet in the IoT environment	UNDERSTANDING
C325.4	Understand various data acquisition methods, data handling using cloud for IoT applications.	UNDERSTANDING
C325.5	Know the implementation of IoT from the case studies like smart home, smart city, etc.	APPLYING
COURSE NAME: DATA BASE MANAGEMENT SYSTEMS (C326)		
C326.1	Identify different architecture where database systems are used (Remembering)	REMEMBERING
C326.2	Classify and compare various data models (Analyzing)	ANALYZING
C326.3	Apply normalization on database for eliminating Redundancy (Applying)	APPLYING
C326.4	Compare various functions of database administrator (Evaluating)	EVALUATING
C326.5	Design basic database storage structures and access techniques (Creating)	CREATING
COURSE NAME: POWER ELECTRONICS LAB(C327)		
C327.1	Understand the Characteristics of Thyristor, MOSFET & IGBT	UNDERSTANDING
C327.2	Design and development of a firing circuits for Thyristor and IGBT..	CREATING
C327.3	Investigate the performance of Single -Phase Half controlled and Full controlled converter with R and RL load	EVALUATING
C327.4	Describe the performance of AC Voltage Regulator and square wave bridge inverter with R and RL Loads.	UNDERSTANDING
C327.5	Able to Verify the voltage gains of Boost converter and buck converter in CCM & DCM operation	EVALUATING
COURSE NAME: MICROPROCESSORS AND MICROCONTROLLERS LAB (C328)		
C328.1	Write in Assembly Language Proramming of the aritlmatic, logic, string, and sorting operations of 8086 microprocessor	UNDERSTANDING
C328.2	Apply the interfacing techniques of the interfacing devices interfaced to 8086 microprocessor	APPLYING
C328.3	Analyse the programming of 8051 microcontroller of programs like reading and writing serial port, serial communication,timers etc	ANALYZING
C328.4	Apply interfacing techniqus of interfacing various peripherals and devices, such as to 8051 such as memory interfacing and stepper motor interfacing	APPLYING
COURSE NAME:EMPLOYALIBILITY SKILLS(C329)		
C329.1	Demonstrate effective presentation and interview skills to excel in their path(Understanding)	UNDERSTANDING
C329.2	Show positive personality traits , best etiquette and manners in both personal and professional life. (Understanding)	UNDERSTANDING
C329.3	Identify and apply time management techniques to attain effectiveness in their career (Applying)	APPLYING
C329.4	Develop strong leadership and decision making capabilities to choose right direction in corporate scenario.(Applying)	APPLYING
C329.5	Build balanced emotional intelligence for effective handling of stress and conflicts at work place. (Applying)	APPLYING

IV YEAR I SEMESTER

COURSE NAME: SWITCH GEAR & PROTECTION (C411)

C411.1	Understand the principles of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type.	UNDERSTANDING
C411.2	Understand the working principle and operation of different types of electromagnetic protective relays.	UNDERSTANDING
C411.3	Students acquire knowledge of faults and protective schemes for high power generator and transformers.	UNDERSTANDING
C411.4	Improves the ability to understand various types of protective schemes used for feeders and bus bar protection.	UNDERSTANDING
C411.5	Understand different types of static relays and their applications.	UNDERSTANDING

COURSE NAME: OOPS THROUGH JAVA (C412)

C412.1	Understand Java programming concepts and utilize Java Graphical User Interface in Program writing.	UNDERSTANDING
C412.2	Write, compile, execute and troubleshoot Java programming for networking concepts	APPLYING
C412.3	Build Java Application for distributed environment.	APPLYING
C412.4	Design and Develop multi-tier applications.	APPLYING
C412.5	Identify and Analyze Enterprise applications	ANALYZING

COURSE NAME: RENEWABLE ENERGY SOURCES (C413)

C413.1	Explain about the solar radiation data, extraterrestrial radiation, radiation on earths	UNDERSTANDING
C413.2	Elaborate about solar photo voltaic systems	ANALYZING
C413.3	Explain about maximum power point techniques in solar pv and wind energy.	UNDERSTANDING
C413.4	Analyze wind energy conversion systems	ANALYZING
C413.5	Elaborate basic principle and working of hydro, tidal,biomass, fuel cell and geothermal systems systems	ANALYZING

COURSE NAME: UTILISATION OF ELECTRICAL ENERGY (C4141)

C4141.1	Identify various illumination methods produced by different illuminating sources	APPLYING
C4141.2	Choose most appropriate Electric heating& Electric welding method for suitable application	APPLYING
C4141.3	Select a suitable motor for electric drives and industrial applications	APPLYING
C4141.4	Distinguish various traction system and determine the tractive effort and specific specific energyconsumption	ANALYZING
C4141.5	Justify the necessity and usage of different energy storage schemes for different applications and comparisons	EVALUATING

COURSE NAME: HIGH VOLTAGE ENGINEERING (C415)

C415.1	Remember the theory of breakdown and withstand phenomena of all types of dielectric materials.	REMEMBERING
C415.2	Acquaint the techniques of generation of AC,DC and Impulse Voltages	UNDRSTANDING
C415.3	Apply Knowledge for measurement of High Voltage and High Current AC,DC and impulse	APPLYING
C415.4	Measure dielectric property of material used for HV equipment	EVALUATING
C415.5	Test various equipments used in HV engineering	ANALYZING

COURSE NAME: LINEAR & DIGITAL IC APPLICATIONS LABORATORY (C416)

C416.1	Summarize functioning, parameters and Specifications of IC741, IC 555, IC 565, IC 566, IC 1496.	UNDERSTANDING
C416.2	Analyze and Develop various circuits using IC 741 op-amp for various applications. Analyze first order Active filter circuits using IC 741 op-ampAnalyze and design amplifiers, active filters and waveform generators.	ANALYZING
C416.3	Analyze the various applications of 555 timer.	ANALYZING
C416.4	Implementation of different combinational logic circuits using ICs	ANALYZING
C416.5	Realize and implementation of different Sequential logic circuits using ICs	ANALYZING

COURSE NAME: POWER SYSTEM AND SIMULATION LAB (C417)

C417.1	Apply software packages like MATLAB/Simulink and PSCAD for power systems.	APPLYING
C417.2	Interpret positive, negative and zero sequence systems and fault analysis	EVALUATING
C417.3	Determine the dielectric strength of transformer oil using HV . testing kit and calibrate the Tong tester	EVALUATING
C417.4	Determine power flow solutions by using different methods	EVALUATING
C417.5	Analyze the performance of transmission lines	ANALYZING

COURSE NAME: INDUSTRIAL TRAINING /SKILL DEVELOPMENT PROGRAMS/ RESEARCH PROJECT (C418)

C418.1	To give students the opportunity to apply the knowledge and skills they have acquired on campus in a real-life work situation	APPLYING
C418.2	To provide students with opportunities for practical, hands-on learning from practitioners in the students' areas of specialization	APPLYING
C418.3	To expose students to a work environment, common practices, employment opportunities and work ethics in their relevant field	APPLYING
C418.4	To enhance the employability skills of the students.	APPLYING
C418.5	To provide opportunities for students to be offered jobs in the organizations in which they undergo their Industrial Training.	APPLYING

COURSE NAME: PROJECT-1 (C419)

C419.1	Student can able to identify and solve the issues related to electrical engineering by using	APPLYING
C419.2	Student should do the literature survey and recall the basics of the subjects in the area from recen	EVALUATING
C419.3	Students able to use conventional and latest technologies and apply the knowledge	APPLYING

IV YEAR II SEMESTER

COURSE NAME: POWER SYSTEM OPERATION & CONTROL (C421)

C421.1	Compute optimal scheduling of Generators	APPLYING
C421.2	Estimate hydrothermal scheduling& Unit commitment Problem.	ANALYZING
C421.3	Develop knowledge on load frequency controllers and modelling of turbine generator &load	APPLYING
C421.4	Distinguish the load frequency control for single area & two area system with and without contro	ANALYZING
C421.5	Explore reactive power control in power systems and compensation of transmission lines	ANALYZING

COURSE NAME: EMBEDED SYSTEMS (C422)

C422.1	Understand the basic concepts of an embedded system and know the characteristics of an embedded system	UNDERSTANDING
C422.2	Explain the components required for an embedded system	UNDERSTANDING
C422.3	Analyze various embedded firmware design approaches on embedded environment.	ANALYZING
C422.4	Discuss the operating system basics and its components, list operating systems and know hardware software co-design	UNDERSTANDING
C422.5	Describe the embedded system development tools and learn the testing process	UNDERSTANDING

COURSE NAME: HVAC & DC TRANSMISSION (C423)

C423.1	Acquaint with HV transmission system with regard to power handling capacity, losses, conductor resistance and electrostatic field associate with HV and gained knowledge in area of bundle conductor system to improve electrical and mechanical performance.	APPLYING
C423.2	Develop ability for determining corona, radio interference, audible noise generation and frequency spectrum for single and three phase transmission lines.	APPLYING
C423.3	Acquire knowledge in transmission of HVDC power with regard to terminal equipments, type of HVDC connectivity and planning of HVDC system.	APPLYING
C423.4	Develop knowledge with regard to choice of pulse copversion, control characteristic, firing angle control and effect of source impedance.	APPLYING
C423.5	Develop knowledge of reactive power requirements of conventional control, filters and reactive power compensation in AC. side of HVDC system.	APPLYING

	COURSE NAME: PROJECT-II (C424)	
C424.1	Student can able to identify and solve the issues related to electrical engineering by engneer	APPLYING
C424.2	Student should do t. he literature survey and recall the basics of the subjects in the area from recent journals and other sources	EVALUATING
C424.3	Student can apply and simulate the result by using different softwares or possible extend that result as a prototype	APPLYING
C424.4	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.	APPLYING
C424.5	Compare the result of their work to improve the quality of work	EVALUATING
C424.6	Student able to identify the future scope enhancement in their project and prepare a thesis or report in a required format and present their work to the panel	CREATING

Ch. S G Rao

Co-ordinator

HOD

HEAD OF THE DEPARTMENT
ELECTRICAL & ELECTRONICS ENGG.,
B.V.C. INSTT. OF TECH. & SCIENCE
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES

BATCH: 2019-23

FIRST YEAR FIRST SEMESTER (I – I)		
English (C111)		
CO #	**COURSE OUTCOME**	**BTL**
C111.1	Classify and compare different things and cultures and behaviors of people from generation to generation.	Understand
C111.2	Select an inspiring personality and to achieve the new heights in personal and professional life.	Apply
C111.3	Apply Science and Technology to transform lives despite physical disabilities and to invent latest Engineering tools for the needs of the Society.	Apply
C111.4	Actively take part in protecting environment and the rights of the underprivileged despite challenges in personal and public life.	Analyze
C111.5	Develop the spirit of inquisitiveness in the areas of interest chosen and to offer insight into how to lead a successful life.	Create
Mathematics – I (C112)		
C112.1	Utilize mean value theorems to relate to various engineering fields.	Apply
C112.2	Solve the first order differential equations and able to apply physical problems.	Apply
C112.3	Solve higher order linear differential equations with constant coefficients. (Application)	Apply
C112.4	Find the partial derivative of different orders, finding maxima and minima of function of two variable, three variables and functional dependence.	Evaluate
C112.5	Apply double integration techniques in evaluating areas bounded by region and also learn important tools of calculus in higher dimensions like 2-dimensional and 3-dimensional coordinate systems.	Apply
Applied Chemistry (C113)		
C113.1	Define composite plastic materials and study the mechanism of conduction in conducting polymers	Understand
C113.2	Classify different types of electrodes and batteries for technological applications	Remember
C113.3	Summarize the importance of engineering materials like nano materials, plastics and rubbers	Understand
C113.4	Explain various methods of preparation and applications of liquid crystals	Understand
C113.5	Explain various models for energy by different natural sources	Understand
Programming for Problem Solving Using C (C114)		
C114.1	Discuss the basic rules of programming to construct algorithms, flowcharts, programs and to compile & debug programs in C.	Understand

C114.2	Develop the various programs by using different types of operators, data types, two-way/ multi-way selection and iterative statements	Apply
C114.3	Demonstrate the usage of arrays, strings and various types of user defined data types	Understand
C114.4	Design and implements programs to analyze the different pointer applications and processor commands	Creating
C114.5	Make use of Files concepts and Standard functions, to decompose a problem into functions and to develop modular reusable code	Apply
English Lab (C116)		
C116.1	Develop the nuances of Pronunciation and make use of International Phonetic Alphabet in order to improve pronunciation while Speaking and Listening.	Apply
C116.2	Divide the words properly into syllables and identify the word stress in di-syllabic, Poly-syllabic words.	Analyze
C116.3	Analyze and understand the stress in compound words, Stress Timed Rhythm and accent neutralizations while listening and speaking.	Analyze.
C116.4	Classify the words into syllables and spell and stress them as per conventions.	Apply
C116.5	Identify the context and specific information while reading and listening to various pieces of texts.	Apply
Applied Chemistry Lab (C117)		
C117.1	Develop better Understanding of titration	Apply
C1117.2	Explain the difference between Solubility and dissociation in water and apply this knowledge to acids and bases	Understand
C117.3	Estimate the hardness of water in terms of calcium and magnesium ions	Evaluate
C117.4	Apply safety rules in practice of laboratory investigations	Apply
C117.5	Explain the different instrumental methods of chemical analysis	Understand
Programming for Problem Solving Using C Lab (C118)		
C118.1	Discuss the basic rules of programming to construct algorithms, flowcharts, programs and to compile & debug programs in C.	Understand
C118.2	Develop the various programs by using different types of operators, data types, two-way/ multi-way selection and iterative statements	Apply
C118.3	Demonstrate the usage of arrays, strings and various types of user defined data types	Understand
C118.4	Design and implements programs to analyze the different pointer applications and processor commands	Creating
C118.5	Make use of Files concepts and Standard functions, to decompose a problem into functions and to develop modular reusable code	Apply
Environmental Science (C119)		
C119.1	Explain the Ecosystem and its function in the environment	Understand
C119.2	Aware the importance of natural resources and its conservation	Understand
C119.3	Analyze the diversity of life on earth and its importance	Analyze
C119.4	Execute different programmes in ecofriendly way	Apply
C119.5	Describe the different laws to protect our environment	Analyze
C119.6	conduct research in safe and responsible manners communicating the environmental subject more effectively	Apply

FIRST YEAR SECOND SEMESTER (I – II)		
COURSE NAME: Mathematics – II C121)		
C121.1	Find Rank and Solve the linear system of equations by using different methods.	Apply
C121.2	Find the inverse and power of a matrix by using Cayley Hamilton theorem. And also, diagonalize the matrix by using various methods. Finding Rank, Index, Signature and Nature of a Quadratic form.	Apply
C121.3	Solve the algebraic and transcendental equations by different methods.	Apply
C121.4	Apply Newton's forward and back ward interpolation and Lagrange's formulae for equal and unequal intervals.	Apply
C121.5	Find the Quadrature, the solutions of ordinary differential equations by different formulae.	Apply
Mathematics - III(C122)		
C122.1	Utilize the vector differential operators (Gradient, Divergence and Curl) and Estimate the work done against a field, circulation and flux using vector.	Evaluate
C122.2	Solve the differential equations using Laplace transforms.	Apply
C122.3	Find the Fourier series of periodic signals.	Apply
C122.4	Form the PDE and identify the solutions of linear and nonlinear PDE	Apply
C122.5	Identify the solution methods for 2nd order partial differential equations representing physical problems.	Apply
Applied Physics (C123)		
C123.1	Explain concept of interference, Diffraction, resolving power of Microscope, Telescope and Grating	Understand
C123.2	Explain concept of Davisson Germer experiment, G.P Thomson experiment and derive Schrodinger wave equations	Understand
C123.3	Explain the concept of K-P model, classical and quantum free electron theories, effective mass of electron.	Apply
C123.4	Explain the concept of types of semiconductors, hall effect and drift, diffusion currents.	Understand
C123.5	Describe the concept of classification of magnetic materials, domain concept, Hysteresis-soft, hard magnetic materials and dielectric materials, types of polarization, Lorentz internal field and Clausius - myosotis equation	Analyze
Network Analysis (C124)		
C124.1	Solve AC and DC circuits using Mesh, Nodal and AC circuit parameters	Apply
C124.2	Analyze RC, RL, RLC transient circuits with DC and AC excitation	Analyze
C124.3	Analyze steady state AC circuits & coupled circuits	Analyze
C124.4	Solve DC and AC circuits using network theorems	Apply
C124.5	Experiment with the two port network parameters	Apply
Basic Electrical Engineering (C125)		
C125.1	Discussed To understand the principle of operation, constructional details and operational characteristics of DC generators.	Understand
C125.2	Discussed To understand the principle of operation, characteristics of DC motor. Methods of starting and speed control methods of DC motors	Understand

FIRST YEAR SECOND SEMESTER (I – II)		
COURSE NAME: Mathematics – II C121)		
C121.1	Find Rank and Solve the linear system of equations by using different methods.	Apply
C121.2	Find the inverse and power of a matrix by using Cayley Hamilton theorem. And also, diagonalize the matrix by using various methods. Finding Rank, Index, Signature and Nature of a Quadratic form.	Apply
C121.3	Solve the algebraic and transcendental equations by different methods.	Apply
C121.4	Apply Newton's forward and back ward interpolation and Lagrange's formulae for equal and unequal intervals.	Apply
C121.5	Find the Quadrature, the solutions of ordinary differential equations by different formulae.	Apply
Mathematics - III(C122)		
C122.1	Utilize the vector differential operators (Gradient, Divergence and Curl) and Estimate the work done against a field, circulation and flux using vector.	Evaluate
C122.2	Solve the differential equations using Laplace transforms.	Apply
C122.3	Find the Fourier series of periodic signals.	Apply
C122.4	Form the PDE and identify the solutions of linear and nonlinear PDE	Apply
C122.5	Identify the solution methods for 2nd order partial differential equations representing physical problems.	Apply
Applied Physics (C123)		
C123.1	Explain concept of interference, Diffraction, resolving power of Microscope, Telescope and Grating	Understand
C123.2	Explain concept of Davisson Germier experiment, G.P Thomson experiment and derive Schrodinger wave equations	Understand
C123.3	Explain the concept of K-P model, classical and quantum free electron theories, effective mass of electron.	Apply
C123.4	Explain the concept of types of semiconductors, hall effect and drift, diffusion currents.	Understand
C123.5	Describe the concept of classification of magnetic materials, domain concept, Hysteresis-soft, hard magnetic materials and dielectric materials, types of polarization, Lorentz internal field and Clausius - myosotis equation	Analyze
Network Analysis (C124)		
C124.1	Solve AC and DC circuits using Mesh, Nodal and AC circuit parameters	Apply
C124.2	Analyze RC, RL, RLC transient circuits with DC and AC excitation	Analyze
C124.3	Analyze steady state AC circuits & coupled circuits	Analyze
C124.4	Solve DC and AC circuits using network theorems	Apply
C124.5	Experiment with the two port network parameters	Apply
Basic Electrical Engineering (C125)		
C125.1	Discussed To understand the principle of operation, constructional details and operational characteristics of DC generators.	Understand
C125.2	Discussed To understand the principle of operation, characteristics of DC motor. Methods of starting and speed control methods of DC motors	Understand

C125.3	Document to learn the constructional details, principle of operation and performance of transformers	Understand
C125.4	Document To study the principle of operation, construction and details of synchronous machines.	Understand
C125.5	Document To learn the principle of operation, constructional details, performance, torque – slip characteristics and starting methods of 3-phase induction motors.	Understand
	Electronic workshop (C126)	
C126.1	To familiarize students with various Electronic devices and their specifications.	Apply
C126.2	To distinguish between active and passive elements	Apply
C126.3	Develop skill for Design and Testing of different types of Electronic subsystems using Analog and Digital IC's	Understand
C126.4	Familiarize students with PCB layout tool to prepare PCB print for assigned project	Analyze
C126.5	To understand the basic concept of Layout Creation.	Apply
	Basic Electrical Engineering Lab(C127)	
C127.1	Determine and predetermine the performance and control of DC machines. (Evaluating)	Evaluating
C127.2	Compute the performance of 1-phase transformer. (Evaluating)	Evaluating
C127.3	Perform tests on 3-phase induction motor and alternator to determine their performance characteristics. (Evaluating)	Evaluating
	Applied Physics Lab (C128)	
C128.1	Apply the knowledge of interference, determine wavelength of a source-diffraction grating, radius of curvature of Plano convex lens using Newton's rings	Apply
C128.2	Analyze the knowledge of semiconductors determine energy gap of p-n junction diode, study of B-H curve, Hall voltage and Hall coefficients.	Apply
C128.3	Explain the resolving power of telescope, grating and dispersive power of diffraction grating.	Understand
C128.4	Analyze the variation of dielectric constant with temperature and also explain dielectric constant by charging and discharging method.	Analyze
C128.5	Analyze the characteristics of Thermistor- temperature coefficients.	Analyze
	Communication Skills Lab (C129)	
C129.1	Develop the skills and confidence to speak publicly, which is valuable in both personal and professional settings. (Apply)	Apply
C129.2	Apply the knowledge of telephonic interviews to get ready for them, establish a rapport with the interviewer, and build trust over the phone. (Apply)	Apply
C129.3	Select a suitable presentation with proper presentational aids to present the information. (Apply)	Apply
C129.4	Analyze the given topic, share the opinions and act efficiently as an individual and team member in Group Discussion. (Analyze)	Analyze
C129.5	Develop an idea about various kinds and stages of interviews to face interviews confidently. (Apply)	Apply
	Engineering Exploration Project (C1210)	

C1210.1	Develop idea(s) and knowledge into tangible form in order to achieve some objective.	Apply
C1210.2	Identify to enhance teamwork and interpersonal skills.	Apply
C1210.3	To incorporate the ability to identify the need, convert it into an objective statement and come up with a solution.	Apply
C1210.4	To understand and apply project management concepts.	Apply
C1210.5	Take part in several design challenges and work towards the final prototypes	Create
	SECOND YEAR FIRST SEMESTER (II – I)	
	Electronics Devices and Circuits (C211)	
C211.1	summarize the Semiconductor physics concepts and also understand the formation of junctions in PN junction diode	Understand
C211.2	Explain the concepts of special diodes Like Zener, tunnel, photo diode, LED and know the working principal of rectifiers with and without filters	Understand
C211.3	Explain the operation of bipolar junction transistors and FET	Understand
C211.4	Understand the need of biasing and also summarize biasing concepts	Understand
C211.5	Analyze the small signal low frequency transistor amplifier models of FET and BJT.	Analyze
	Switching Theory and Logic Design (C212)	
C212.1	Summarize concepts of various types' number systems and their conversions and Boolean algebra for logic gates.	Understand
C212.2	To Build simple logical operations using combinational logic circuits with minimization techniques.	Apply
C212.3	To Develop combinational logic circuits and programmable logic devices.	Apply
C212.4	To construct sequential logic circuits with flip-flops and their applications.	Apply
C212.5	To demonstrate advanced sequential circuits.	Understand
	Signals and Systems (C213)	
C213.1	Illustrate the basic idea of signals and systems	Understand
C213.2	Analyze the frequency domain representation of signals using FS and FT	Analyze
C213.3	Analyze the systems based on their properties and determine the response of LTI and LTV Systems	Analyze
C213.4	Apply sampling theorem to convert continuous time signals to discrete time signals.	Apply
C213.5	Apply Laplace and z-transforms to Solve Signals and Systems (continuous & discrete).	Apply
	Random Variables and Stochastic Processes (C214)	
C214.1	Understand the axiomatic formulation of modern Probability Theory and think of random variables as an intrinsic need for the analysis of random phenomena.	Understand
C214.2	Identify different types of random variables and compute statistical averages of these random variables.	Understand
C214.3	Analyze the joint distribution and marginal distribution functions of multiple random variables	Analyze
C214.4	Classify the random processes in the time and frequency domains	Analyze
C214.5	Analyze the LTI systems with random inputs.	Analyze

Object Oriented Programming through Java (C215)		
C226.1	Identify Object oriented concepts Through Constructs of JAVA	Understand
C226.2	Analyze and implement the role of packages, Interfaces in program design using JAVA.	Analyze
C226.3	Choose the basic principles of creating Java applications with Graphical user interface	Evaluate
C226.4	Design Java programs that uses Input and Output File Streams.	Create
C226.5	Analyze applications of Java Multi-Threading and Exception Handling.	Analyze
Managerial Economics and Financial Analysis (C216)		
C216.1	Define the fundamental concepts of managerial economics.	Remember
C216.2	Classify and compare various costs in managerial decision-making process	Analyze
C216.3	Identify the features of different market structures and various forms of Business organizations	Apply
C216.4	Identify fundamental concepts of accounting and Analyze financial statements.	Apply
C216.5	Evaluate various alternative investment proposals to make a better capital budgeting decision	Evaluate
Electronic Devices and Circuits Lab (C217)		
C217.1	Explain about analog meters, digital meters, RPS, DMM and CRO	Understand
C217.2	Utilize the voltage and current relationships of PN Diode and Zener diode	Apply
C217.3	Construct and Develop efficiency and % regulations of Halfwave and Full wave rectifiers with and without filters	Apply
C217.4	Identify and compare the characteristics of BJT, FET, SCR and UJT in different configurations	Apply
C217.5	Construct the different amplifier circuits for BJT and FET	Apply
Switching Theory and Logic Design - Lab (C218)		
C218.1	Demonstrate various ICs like 74LSXX Family with their specification.	Understand
C218.2	Solve the given expression and Develop it using Basic gates and Universal gates.	Apply
C218.3	Develop Full adders using two Half-adders and verify the functionality using IC's.	Apply
C218.4	Construct various combinational logic circuits like adders & multiplexers etc., Build Boolean functions using decoders and multiplexers	Apply
C218.5	Construct various sequential logic circuits like flip-flops, counters and shift Registers.	Apply
Constitution of India (C219)		
C219.1	Apply the knowledge on Directive principle of state policy	Apply
C219.2	Explain the role of President and Prime Minister, the structure of Supreme Court and High court.	Understand
C219.3	Analyze the role of Governor and Chief Minister	Analyze
C219.4	Differentiate between structure and functions of state secretariat.	Understand
C219.5	Analyze the role of Mayor and elected representatives of Municipalities.	Analyze
SECOND YEAR SECOND SEMESTER (II – II)		
Electronic Circuit Analysis (C221)		

C221.1	Explain classification of amplifiers and analyze the CE, CB, CC amplifiers using small signal hybrid model and derive the voltage gain, current gain, input impedance and output impedance.	Understand
C221.2	Illustrate various methods of coupling in multistage amplifiers by using Transistors.	Apply
C221.3	Develop and classify the different types of feedback amplifiers.	Analyze
C221.4	Design and analyze different types of oscillators	Analyze
C221.5	Classify various power amplifiers. Design and analyze the effects of cascading on single, double tuned amplifiers on bandwidth and explain their stability	Analyze
Linear Control Systems (C222)		
C222.1	Understand the basic concepts of control systems, Translational and rotational mechanical Systems	Understand
C222.2	Understand and implement mathematical tools (such as Block Diagram reduction and SFG) to analyze a complete system and analyze the Time Response analysis of the system.	Understand
C222.3	Analyze system's absolute, relative stability using different s-domain methods.	Analyze
C222.4	Sketch the Frequency response plots and analyze the system performance	Apply
C224.5	Design compensators and their selection to meet desired response and analyze the control system using state space analysis	Create
Electromagnetic Waves and Transmission Lines (C223)		
C223.1	To solve the basic Transmission Line Equations and telephone line parameters and estimate the distortions present.	Apply
C223.2	To summarize the concepts of RF Lines and their characteristics, Smith Chart and its applications.	Understand
C223.3	To summarize the concept of co-ordinate systems and vector algebra and their applications in free space to Concepts and proofs related to Electrostatic Fields.	Understand
C223.4	To analyze Magneto static Fields, and apply them to solve physics and engineering problems and distinguish between static and time-varying fields.	Analyze
C223.5	To analyze the characteristics of Uniform Plane Waves (UPW), determine their propagation parameters and estimate the same for dielectric and dissipative media.	Understand
Analog Communications (C224)		
C224.1	Illustrate various continuous wave Amplitude modulation and demodulation techniques	Understand
C224.2	Explain the basic concepts of DSB & SSB MODULATION schemes and Applications of different AM Systems	Understand
C224.3	Apply the concepts of angle modulation and demodulation techniques on the time and frequency domain techniques.	Apply
C224.4	Attain the knowledge about the functioning of different AM, FM Transmitters and Receivers.	Understand
C224.5	Examine SNR and Figure of merit for different analog modulation techniques and Pulse Modulation Techniques	Analyze
Computer Architecture and Organization (C225)		

C225.1	Summarize the functional units and basic operational concepts of a computer, examine the performance of a computer using performance equation and different instruction types.	Apply
C225.2	Calculate the effective address of an operand using addressing modes and explain various types of instructions.	Apply
C225.3	Explain the organization of input and output devices connected to a computer.	Understand
C225.4	Classify various memory systems/devices used in a computer and explain mapping techniques of cache.	Understand
C225.5	Examine the process of execution of complete instruction and outline micro programmed control.	Analyze
	Management and Organizational Behavior (C226)	
C226.1	Explain the fundamental concepts of management and organization	Understand
C226.2	Identify the functional areas of management	Apply
C226.3	Examine various elements of strategic management	Analyze
C226.4	find the impact of motivation and other factors which shape individual behavior	Remembering
C226.5	Interpret the strategies for effective management of groups, culture and conflicts in an organization	Evaluate
	Electronic Circuit Analysis Lab (C227)	
C227.1	Recognize the response and fT of a given transistor.	Understand
C227.2	Analyze the feedback amplifier circuits and tuned amplifier circuits working principle and obtain its Frequency response using hardware and software.	Analyze
C227.3	Calculate the frequency response of oscillator's circuits both theoretical and practical on both hardware components and software.	Apply
C227.4	Design the multistage amplifiers circuits and Measure the voltage gain and bandwidth by using hardware components and software.	Evaluate
C227.5	Analyze the experiments with various signal and power amplifier circuits using BJTs.	Analyze
	Analog Communications Lab (C228)	
C228.1	Demonstrate about spectrum analyzer, MATLAB communication tool box	Understand
C228.2	Utilize the spectrum analyzer, MATLAB Simulink and MATLAB communication Tool box to perform the relevant experiments	Apply
C228.3	Experiment with time domain of Analog modulation and Demodulation Techniques and also find the modulation index and characteristics of Radio receiver	Apply
C228.4	Construct the sampling theorem and to apply in time and frequency domain of pulse modulation and Demodulation techniques	Apply
C228.5	Experiment with time domain of Analog modulation and Demodulation Techniques and also find the modulation index and observe the characteristics of AGC, PLL	Apply
	THIRD YEAR FIRST SEMESTER (III – I)	
	COURSE NAME: Linear Integrated Circuits and Applications (C311)	
C311.1	Summarize types of Differential Amplifier configurations & performance parameters of differential amplifiers.	Understand
C311.2	Construct the Linear & Non-Linear applications of Op-Amp.	Apply

C311.3	Analyze different types of Op-Amp Active filters to solve the frequency response characteristics and summarize the Analog multipliers and Sample & Hold circuits.	Analyze
C311.4	Understand the functional blocks & Explain the applications of IC's 555 Timer,565 PLL and 566 VCO	Understand
C311.5	Analyze various types of DAC and ADC techniques and characteristics.	Analyze
	Microprocessor and Microcontrollers (C312)	
C312.1	Discover Harvard, Von Neumann, RISC, CISC, 8086 processors architecture types	Analyze
C312.2	Compile ALP for 8086 using program development tools	Create
C312.3	Examine 8086 based system using memory, PPI, UART, DMA A/D and D/A devices	Analyze
C312.4	Evaluate 8051 microcontroller system.	Evaluate
C312.5	Compile software delay, loops, stack and subroutines for ARM Cortex 3 Processor.	Create
	Digital Communications (C313)	
C313.1	Express basic theories of Digital communication system and different techniques.	Understand
C313.2	Build digital modulation techniques power and bandwidth requirements of modern communication system.	Apply
C313.3	Analyze probability of error of various filters and digital modulation techniques.	Analyze
C313.4	Identify basic concepts of Information theory and source coding techniques for Communication Systems.	Apply
C313.5	Utilize different error control coding schemes.	Apply
	Electronic Measurements & Instrumentation (C314)	
C314.1	Summarize performance characteristics of instruments and multi-meters for voltage, current and resistance measurements	Understand
C314.2	Identify various signal generators and wave analyzers	Apply
C314.3	Experiment with various types of CROs (analog and digital)	Apply
C314.4	Construct AC bridges	Apply
C314.5	Utilize active and passive transducers	Apply
	Digital System Design using HDL (C315)	
C315.1	Understand the architecture of FPGA'S and EXPLAIN the different modules in Verilog HDL	Understand
C315.2	Discuss the various data types and Operators in Verilog HDL	Understand
C315.3	Design the combinational circuit by using Verilog HDL	Apply
C315.4	Design the Sequential circuit by using Verilog HDL	Apply
C315.5	Implement various Applications and Digital Interfacing in Verilog HDL	Apply
	Linear Integrated Circuits and Applications - Lab (C316)	
C316.1	Summarize functioning, parameters and Specifications of IC 741, IC 555, IC 565, IC 566, IC 1496.	Understand
C316.2	Analyze and Develop various circuits using IC 741 op-amp for Linear and Non Linear applications.	Analyze
C316.3	Analyze and design amplifiers, active filters and waveform generators.	Create

C316.4	Analyze the various applications of 555 timer, IC 565 – PLL and IC 566 – VCO	Analyze
C316.5	Experiment with IC 78XX and 79XX to build dual power supply.	Apply
	Digital Communications Lab (C317)	
C317.1	Develop multiplexing and demultiplexing technique.	Apply
C317.2	Develop analogue to digital converters like PCM, DM.	Apply
C317.3	Demonstrate digital modulation and demodulation techniques.	Understand
C317.4	Analyze the performance of Companding technique and its performance.	Analyze
C317.5	Make use of Encoding and Decoding process of block codes, convolution codes.	Apply
	Microprocessor and Microcontrollers - Lab (C318)	
C326.1	Explain Find how different instructions are affected before and after execution.	Understand
C326.2	Experiment with various 8086 ALP microprocessor programs like arithmetic operations, sorting and factorial of given numbers using MASM Software	Apply
C326.3	Demonstrate various interfacing modules of 8255PPI, ADC, DAC Keyboard/Display and generates different waveforms using ALPs with 8086 microprocessors	Aplly
C326.4	Experiment with various assembly language programs of 8051 microcontroller using Keilμ Vision software	Apply
C326.5	Construct various interfacing modules using ALPs of 8051 microcontroller that operates LED display, Stepper motor and Traffic light controller	Apply
	Mini Project with Hardware Development (C319)	
C319.1	Choose proposal which is relevant to subject of engineering (Apply)	Apply
C319.2	Design the system components and process and identify the engineering tools (Create)	Create
C319.3	Use management skills and implement task, manages problems encountered, work as a team and present the work progress (Apply)	Apply
C319.4	Incorporate the suggestions made and manages resources and work as team. (Apply)	Apply
C319.5	Develop a final product/ process, organize testing and conclude the suggested future scope (Apply)	Apply
	Essence of Indian Traditional Knowledge (C3110)	
C3110.1	Identify the concept of Traditional knowledge and its importance	Apply
C3110.2	Explain the need and importance of protecting traditional knowledge.	Understand
C3110.3	Illustrate the various enactments related to the protection of traditional knowledge.	Understand
C3110.4	Interpret the concepts of Intellectual property to protect the traditional knowledge.	Understand
C3110.5	Explain the importance of Traditional knowledge in Agriculture and Medicine.	Understand
	Third year second semester (III – II)	
	Wired and Wireless Transmission Devices (C321)	
C321.1	Discuss different types of waveguides and their respective modes of propagation and Microstrip line concept.	Understand

C321.2	Illustrate basic terminology and concepts of Antennas	Apply
C321.3	Analyze the field components, parameters of thin linear wire antennas and understand the antenna arrays and characteristics.	Analyze
C321.4	Analyze geometry, basic properties, and parameters of non-resonant radiators and understand the vhf, uhf and microwave antennas.	Analyze
C321.5	Analyze the characteristics of radio wave propagation and antenna measurements	Analyze
	VLSI Design (C322)	
C322.1	Explain IC fabrication process of NMOS, PMOS, CMOS and various electrical properties of MOS transistors	Understand
C322.2	Summarize basic circuit concepts and determine impact of scaling on MOS circuits	Understand
C322.3	Design basic building blocks in Analog IC design	Apply
C322.4	Analyze the behavior of static and dynamic logic circuits	Apply
C322.5	Explain the concept of FPGA design process and FPGA families for implementing different logic circuits and advanced technologies	Understand
	Digital Signal Processing (C323)	
C323.1	Analyze the Discrete Time Signals and Systems in Time and Frequency Domain and Review of Z-Transforms.	Analyze
C323.2	Examine the properties of Discrete Fourier Series and Discrete Fourier Transforms and Explain the linear filtering methods based on DFT and FFT algorithms.	Apply
C323.3	Illustrate the analog filter approximations techniques and various implementations of IIR digital filter structures.	Apply
C323.4	Determine the different window techniques and frequency sampling techniques of FIR digital filter	Apply
C323.5	Explain the programmable DSPs features and architectural features of different ARM processors	Understand
	Cellular & Mobile Communication (C324)	
C324.1	Explain cellular radio concepts	Understand
C324.2	Identify various interferences	Apply
C324.3	Analyze frequency management, channel assignment and discuss cell coverage for signal and traffic.	Analyze
C324.4	Summarize types of Handoff strategies	Understand
C324.5	Classify multiple access techniques in mobile communication.	Analyze
	MEMS and its applications (C325)	
C325.1	Discover the overview of MEMS and Microsystems with broad category of MEMS & Micro system applications.	Understand
C325.2	Demonstrate the working principles of Microsystems	Understand
C325.3	Discuss the Scaling Laws in Miniaturization and Outline Materials for MEMS and Microsystems	Understand
C325.4	Discuss the Micro system Fabrication Processes, different Micro manufacturing processes and Applications.	Understand
C325.5	Identify the different types of RF switches, Various Switching Mechanism and their applications.	Understand
	COURSE NAME: Internet of Things (C326)	

C326.1	Explain the basics, definition and vision of Internet of Things (IoT). Understand the IOT architectural domains and relationships of an M2M system with an IoT system and explain the business process and cloud computing in IoT	Understand
C326.2	Understand the Hardware Components- Computing- Arduino, Raspberry Pi, ARM Cortex-A class processor, Embedded Devices – ARM Cortex-M, Cortex-M0 Architecture, Block Diagram, Instruction Set, ARM and Thumb Instruction Set	Understand
C326.3	Analyze Communication, IoT Applications, Sensing, Actuation, I/O interfaces. Software Components- Programming API's (using Python/Node.js/Arduino) for Communication Protocols, Bluetooth overview, Bluetooth Key Versions, Bluetooth Low Energy (BLE) Protocol, BLE architecture and Component Overview	Analyze
C326.4	Discuss the Implementation of Device integration, Data acquisition and integration, Device data storage Unstructured data storage on cloud/local server, Authentication, authorization of devices.	Understand
C326.5	Use the IoT concepts to IoT case studies and mini projects based on Industrial automation, Transportation, Agriculture, Healthcare, Home Automation	Apply
VLSI Lab (C327)		
C327.1	Developed VHDL source code for logic gates using Xilinx's software tool	Apply
C327.2	develop VHDL source code for combinational & sequential circuits using Xilinx's software tool	Apply
C327.3	design basic logic circuits in backend environment using mentor graphics tool	Apply
C327.4	design combinational &sequential circuits in backend environment using mentor graphics tool	Apply
Digital Signal Processing Lab (C328)		
C328.1	Understand the mathematical operation on discrete signals.	Understand
C328.2	Sketch the magnitude and phase response of DFT, Inverse DFT and FFT of discrete time signals.	Apply
C328.3	Calculate linear and circular convolution of discrete sequences.	Analyze
C328.4	Analyze IIR and FIR digital filters	Analyze
C328.5	Develop and Implement DSP algorithms in software using a computer language such as C with TI DSP Starter Kit	Apply
Intellectual Property Rights (IPR) & Patents (C329)		
C329.1	Interpret the Concept of IPR Importance and mechanisms.	Understand
C329.2	Utilize knowledge regarding copyrights to get them registered.	Apply
C329.3	Identify the filing procedure of patents and role of Patent Cooperation Treaty.	Apply
C329.4	Analyze rights and responsibilities of holder of Trademarks and Likelihood of Confusion - Dilution of Ownership.	Analyze
C329.5	Illustrate the concepts of trade secrets and cyber laws.	Understand
FINAL YEAR FIRST SEMESTER (IV – I)		
Microwave and Optical Communication Engineering (C411)		
C411.1	Understand the fundamental characteristics of Microwave guides sources and amplifiers through electromagnetic field analysis.	Understand

C411.2	Understand the basic properties of waveguide components and Ferrite materials composition.	Understand
C411.3	Learn and the basic elements of optical fiber transmission link, fiber modes configurations and structures and joints.	Remember
C411.4	Analyze the various Optical sources and detectors and Optical system design	Analyze
C411.5	Analyze Microwave Measurements & Optical Measurements	Analyze
Data Communications & Computer networks (C412)		
C412.1	Have knowledge on the data communication components, types of networks, distributed processing, OSI Reference model and TCP/IP protocol suite, addressing concepts, and wireless LANs	Understand
C412.2	Have knowledge about services performed by data link layer such as error detection and error correction and analyses the noisy and noiseless channels completely	Analyze
C412.3	Have knowledge on functions of networks layer, forwarding and routing, and the Internet Protocol (IP) and its versions	Understand
C412.4	Analyze about the services offered by transport layer and study the TCP and UDP protocols concepts related to them	Analyze
C412.5	Apply the transport layer protocols to applications and application layer functions	Apply
Digital Image and Video Processing (C413)		
C413.1	Explain the digital image, representation of digital image, importance of image resolution, applications in image processing. And to Explain the advantages of representation of digital images in transform domain, application of various image transforms.	Understand
C413.2	To explain how an image can be enhanced by using histogram techniques, filtering techniques etc. and image degradation, image restoration techniques using spatial filters and frequency domain	Understand
C413.3	make use of segmentation process to know detection of point, line and edges in images, edge linking through local processing, global processing and Understand the redundancy in images and make use the concept of Image compression to know various image compression techniques	Apply
C413.4	To understand the video technology from analog color TV systems to digital video systems, how video signal is sampled and filtering operations in video processing	Understand
C413.5	To demonstrate the general methodologies for 2D motion estimation and Application of motion estimation in Video coding	Understand
Communication Standards and Protocols (C414)		
C414.1	Illustrate various communication and communication networking types and their characteristics.	Understand
C414.2	Identify OSI communication layers and their applications	Understand
C414.3	Examine wired communication protocols and Inspect their advantages and disadvantages, applications	Analyze
C414.4	Analyze various wireless communications protocols and their advantages and disadvantages and applications	Analyze
C414.5	Categorize various network types and Routing algorithm and its applications	Analyze
COURSE NAME: Embedded Systems (C415)		

C415.1	Understand the basic concepts of an embedded system and know the characteristics of an embedded system	Understand
C415.2	Explain the components required for an embedded system	Understand
C415.3	Analyze various embedded firmware design approaches on embedded environment.	Analyze
C415.4	Discuss the operating system basics and its components, list operating systems and know hardware software co-design	Understand
C415.5	Describe the embedded system development tools and learn the testing process	Understand
	Internet of Things LAB (C416)	
C416.1	Understand the concept of Internet of Things	Understand
C416.2	Implement the interfacing of various sensors with Arduino/Raspberry Pi/Node MCU	Apply
C416.3	Demonstrate the ability to transmit data wirelessly between different devices.	Analyze
C416.4	Set up a Bluetooth Smart connection between the PSoC, BLE kit and a smart phone and use an app to send and receive data	Analyze
	Microwave and Optical Communication Engineering LAB (C417)	
C417.1	Make use of Microwave sources and identify the characteristics for the transmission of the microwave signal.	Apply
C417.2	Experiment with waveguide components and Determine various parameters for them.	Apply
C417.3	Demonstrate characteristics of various light Sources.	Apply
C417.4	Determine various measurements for optical Links.	Apply
C417.5	Utilize antenna available to determine radiation pattern.	Apply
	Project - Part I (C418)	
C418.1	Outline detailed study of topic assigned	Understand
C418.2	Organize a literature survey using latest journals in the preferred field of study	Apply
	FINAL YEAR SECOND SEMESTER (IV – II)	
	Wireless Communication (C421)	
C422.1	Explain About Various Wireless Communication Concepts Like 2G,3G,4G Wireless Communication.	Understand
C422.2	Analyze CDMA Process and Related Topics of Wireless Communication	Analyze
C422.3	Analyze the Multiple-Input Multiple-Output of Wireless Communication	Analyze
C422.4	Apply OFDM Concept to Wireless Communication	Apply
C421.5	Explain About Satellite Wireless System Like Transponders and Geostationary Satellites	Understand
	Cyber Security &Cryptography (C422)	
C422.1	Able to identify security risks and take preventive steps	Understand
C422.2	To understand the forensics fundamentals.	Understand
C422.3	To understand the evidence capturing process and Analyze various tools.	Analyze
C422.4	To understand the preservation of digital evidence and APPLY various tools in collection of digital evidence	Apply
C422.5	To Understand and implement various Acts in cybercrime and to implement laws in cybercrime.	Understand

COURSE NAME: Project - Part II (C423)		
C423.3	Develop a detailed plan for conducting project including teamwork	Apply
C423.4	Build a detailed analysis/modelling/simulation/design/problem-solving as needed	Apply
C423.5	Develop a final product/process, organize testing and show thesis to review panel and explain the work	Understand

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AMALAPURAM

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Department of Computer Science and Engineering

COURSE OUTCOMES : R19 CURRICULUM

COURSE CODE	COURSE OUTCOME	BLOOMS TAXONOMY LEVEL
	I YEAR I SEMESTER	
COURSE NAME:ENGLISH I (C111)		
C111.1	Identify the various sources of happiness and using function words to express in a structured form following the mechanics of writing.	Apply
C111.2	Motivate others by powerful writing, using appropriate forms of writing following the basics of English Grammar.	Analyze
C111.3	Estimate the influence of powerful personalities by following the various methods of reading.	Create
C111.4	Assess the significance of various movements relating to environmental protection.	Evaluate
C111.5	Illustrate with examples of the various stages of development of eminent personalities.	Understand
COURSE NAME: MATHEMATICS-I (C112)		
C112.1	Utilize mean value theorems to related to various engineering fields.	Apply
C112.2	Solve the first order differential equations and able to apply physical problems.	Apply
C112.3	Solve higher order linear differential equations with constant coefficients.	Apply
C112.4	Find the partial derivative of different orders, finding maxima and minima of function of two variable, three variables and functional dependence.	Evaluation
C112.5	Apply double integration techniques in evaluating areas bounded by region and also learn important tools of calculus in higher dimensions like 2-dimensional and 3-dimensional coordinate systems.	Apply
COURSE NAME: APPLIED CHEMISTRY (C113)		
C113.1	Define composite plastic materials and study the mechanism of conduction in conducting polymers	Understand

C113.2	Classify different types of electrodes and batteries for technological applications	Remember
C113.3	Summarize the importance of engineering materials like nano materials ,plastics and rubbers	Understand
C113.4	Explain various methods of preparation and applications of liquid crystals	Understand
C113.5	Explain various models for energy by different natural sources	Understand
COURSE NAME: FUNDAMENTALS OF COMPUTER SCIENCE (C114)		
C114.1	Illustrate input and output devices of Computers and how it works and recognize the basic terminology used in computer programming.	Understand
C114.2	Apply the basic concepts of programming language for Problem Solving and Programming.	Apply
C114.3	Illustrate the basic concepts of Computer networks, types of networks and topologies	Understand
C114.4	Illustrate the basic concepts of Databases and System design	Understand
C114.5	Illustrate Advanced Computer Technologies like Distributed Computing & Wireless Networks	Understand
COURSE NAME: ENGINEERING DRAWING (C115)		
C115.1	To introduce the students to use drawing instruments and to draw polygons, Engg curves.	Understand
C115.2	To introduce the students to use orthographic projections, projections of points & simple lines. To make the students draw the projections of the lines inclined to both the planes.	Apply
C115.3	The objective is to make the students draw the projections of the plane inclined to both the planes	Analysing
C115.4	Objective: The objective is to make the students draw the projections of the various types of solids in different positions inclined to one of the planes	Analysing
C115.5	The objective is to represent the object in 3D view through isometric views. The student will be able to represent and convert the isometric view to orthographic view and vice versa	Apply
COURSE NAME: ENGLISH LAB (C116)		
C1116.1	Develop the nuances of Pronunciation and make use of International Phonetic Alphabet in order to improve pronunciation while Speaking and Listening.	Apply
C1116.2	Divide the words properly into syllables and identify the word stress in di-syllabic, Poly-syllabic words.	Analyze
C1116.3	Analyze and understand the stress in compound words, Stress Timed Rhythm and accent neutralizations while listening and	Analyze

	speaking.	
C1116.4	Classify the words into syllables and spell and stress them as per conventions.	Apply
C1116.5	Identify the context and specific information while reading and listening to various pieces of texts.	Apply
COURSE NAME: APPLIED CHEMISTRY LAB (C117)		
C117.1	Develop better understanding of titration	Understand
C117.2	Explain the difference between Solubility and dissociation in water and apply this knowledge to acids and bases	Apply
C117.3	Estimate the hardness of water in terms of Calcium and Magnesium ions	Apply
C117.4	Apply safety rules in practice of laboratory investigations	Apply
C117.5	Explain the different instrumental methods of chemical analysis	Apply
COURSE NAME: IT WORKSHOP (C118)		
C118.1	Assemble and disassemble components of a PC	Understand
C118.2	Construct a fully functional virtual machine, Summarize various Linux operating system commands	Apply
C118.3	Secure a computer from cyber threats, Learn and practice programming skill in Github, Hackerrank, Codechef, HackerEarth etc	Create
C118.4	Recognize characters & extract text from scanned images, Create audio files and podcasts	Analyze
C118.5	Create video tutorials and publishing, Use office tools for documentation, Build interactive presentations, Build websites, Create quizzes & analyze responses.	Create
COURSE NAME: ENVIRONMENTAL SCIENCE (C119)		
C119.1	Overall understanding of the natural resources.	Understand
C119.2	Basic understanding of the ecosystem and its diversity	Understand
C119.3	Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities	Analyze
C119.4	An understanding of the environmental impact of developmental activities	Understand
C119.5	.Awareness on the social issues, environmental legislation and global treaties	Apply
I YEAR II SEMESTER		
COURSE NAME: MATHEMATICS-II (C121)		
C121.1	Find Rank and Solve the linear system of equations by using different methods.	Apply

C121.2	Find the inverse and power of a matrix by using Cayley Hamilton theorem. And also diagonalize the matrix by using various methods. Finding Rank, Index, Signature and Nature of a Quadratic form.	Apply
C121.3	Solve the algebraic and transcendental equations by different methods.	Apply
C121.4	Apply Newton's forward and back ward interpolation and Lagrange's formulae for equal and unequal intervals.	Apply
C121.5	Find the Quadrature, the solutions of ordinary differential equations by different formulae.	Apply
COURSE NAME: MATHEMATICS - III (C122)		
C122.1	Utilize the vector differential operators (Gradient, Divergence and Curl) and Estimate the work done against a field, circulation and flux using vector .	Evaluation
C122.2	Solve the differential equations using Laplace transforms.	Application
C122.3	find the Fourier series of periodic signals.	Application
C122.4	Able to form the PDE and identify the solutions of linear and non linear PDE .	Application
C122.5	identify the solution methods for 2nd order partial differential equations representing physical problems.	Application
COURSE NAME: APPLIED PHYSICS (C123)		
C123.1	Explain concept of interference, Diffraction, resolving power of Microscope, Telescope and Grating	Apply
C123.2	Explain concept of Davisson Germer experiment ,G.P Thomson experiment and derive schrodinger wave equations	Apply
C123.3	Explain the concept of K-P model , classical and quantum free electron theories, effective mass of electron .	Apply
C123.4	Explain the concept of types of semiconductors, hall effect and drift,diffusion currents.	Apply
C123.5	Describe the concept of classification of magnetic materials, domain concept, Hysteresis-soft, hard magnetic materials and dielectric materials, types of polarization, Lorentz internal field and claussius - mossoti equation.	Understand
COURSE NAME: PROGRAMMING FOR PROBLEM SOLVING USING C(C124)		
C124.1	Illustrate the basic concepts of C Programming language.	Apply
C124.2	Develop C-programs by utilizing various operators and control structures.	Create
C124.3	Analyze and classify various types of arrays,strings and userdefined datatypes.	Analyze
C124.4	Demonstrate the ideas of pointers usage	Apply
C124.5	Solve real world problems using the concept of functions and File operations.	Create

COURSE NAME: DIGITAL LOGIC DESIGN (C125)		
C125.1	classify different number systems and apply to generate various codes.	Understand
C125.2	Apply the concept of Boolean algebra in minimization of switching functions	Apply
C125.3	Analyse different types of combinational logic circuits.	Analyze
C125.4	apply knowledge of flip-flops in designing of Registers and counters	Apply
C125.5	produce innovative designs by modifying the traditional design techniques.	Analyze
COURSE NAME: APPLIED PHYSICS LAB (C126		
C126.1	Apply the knowledge of interference ,determine wavelength of a source-diffraction grating,radius of curvature of plano convex lens using newton's rings	Apply
C126.2	Analyze the knowledge of semiconductors determine energy gap of p-n junction diode,study of B-H curve,Hall voltage and Hall coefficients.	Analyze
C126.3	Explain the resolving power of telescope , grating and dispersive power of diffraction grating.	Apply
C126.4	Analyze the variation of dielectric constant with temperature and explain dielectric constant by charging and discharging method.	Analyze
C126.5	Analyze the characteristics of Thermistor- temperature coefficients..	Analyze
COURSE NAME: COMMUNICATION SKILLS LAB (C127)		
C127.1	Understand the meaning, process and importance of communication and overcome communication barriers.	Understand
C127.2	Demonstrate correct usage of grammar.	Apply
C127.3	Write cohesive paragraphs, reports and letters.	Create
C127.4	Analyze the short stories of renowned authors.	Analyze
C127.5	Analyze the content and comprehending the appropriate use of language and literary terms.	Analyze
COURSE NAME: PROGRAMMING FOR PROBLEM SOLVING USING C LAB (C128)		
C128.1	Illustrate the basic concepts of C Programming language	Apply
C128.2	Develop C-programs by utilizing various operators and control structures.	Create
C128.3	Analyze and classify various types of arrays,strings and userdefined datatypes.	Analyze
C128.4	Demonstrate the ideas of pointers usage	Apply
C128.5	Solve real world problems using the concept of functions and File operations.	Create
COURSE NAME: ENGINEERING EXPLORATION PROJECT (C129)		

C129.1	Interpret and debug programs in C language, Demonstrate syntaxes, predefined functions and operators in computer programming languages.	Understand
C129.2	Demonstrate C programs involving decision making statements, iterative statements and understanding the control flow of the programs	Apply
C129.3	Classify Arrays, Strings and Develop C programs using String manipulation functions	Analyze
C129.4	Design programs using pointers and dynamic memory management functions	Create
C129.5	Construct functions, create files and develop programs using file handling functions	Create
COURSE NAME: CONSTITUTION OF INDIA (C1210)		
C1210.1	Outline historical background of the constitution making and its importance for building a democratic India.	Understand
C1210.2	Summarize the functioning of three wings of the government ie., executive, legislative and judiciary	Understand
C1210.3	Interpret the value of the fundamental rights and duties for becoming good citizen of India.	Understand
C1210.4	Analyze the decentralization of power between central, state and local self-government.	Analyze
C1210.5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy	Apply
II YEAR I SEMESTER		
COURSE NAME: MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE (C211)		
C211.1	Understand the skills in various solving mathematical problems	Understand
C211.2	Apply mathematical principles and logic	Apply
C211.3	Analyze knowledge of mathematical modeling and proficiency in using algebraic system.	Analyze
C211.4	Solve mathematical calculations using techniques such as permutations and combinations	Create
C211.5	Communicate effectively mathematical ideas/results verbally or in writing and Create the data numerically and / or graphically using appropriate mathematical algorithms	Create
COURSE NAME: SOFTWARE ENGINEERING (C212)		
C212.1	Identify suitable life cycle models to be used.	Understand
C212.2	Compare conventional and agile software methods.	Analyze
C212.3	Analyze the problem and create a model to the problem.	Analyze
C212.4	Translate a requirement specification to a design using an appropriate software engineering methodology.	Create

C212.5	Skills to design, implement, and execute test cases and perform debugging.	Apply
COURSE NAME: PYTHON PROGRAMMING (C213)		
C213.1	Develop programming skills in computer programming concepts like data types, conditional and looping statements	Apply
C213.2	Design and implement Programs on strings	Create
C213.3	Illustrates functions, modules and packages	Understand
C213.4	Solve coding tasks related to the fundamental notions and techniques used in object-oriented programming	Apply
C213.5	Solve Exceptions and GUI based programs	Apply
COURSE NAME: DATA STRUCTURES (C214)		
C214.1	Discuss the computational efficiency of the principal algorithms for sorting & searching	Understand
C214.2	Use Linked List Structure to perform various operations like traverse, searching Operations in Writing Programs	Apply
C214.3	Use arrays, records, linked structures, stacks, queues, in writing programs	Apply
C214.4	Demonstrate different methods for traversing trees	Apply
C214.5	Construct various Graph Traverse Techniques using Different Types of Algorithms	Create
COURSE NAME: OBJECT ORIENTED PROGRAMING THROUGH C++ (C215)		
C215.1	Enumerate the key concepts of Object Oriented Programming	Understand
C215.2	Use of Object Oriented Technology to experiment special class operations	Apply
C215.3	Implement the concept of polymorphism through operator overloading that enhances reusability	Apply
C215.4	Analyze binding, polymorphism and virtual functions	Analyze
C215.5	Apply Exception handling techniques for resolving run-time errors and use of templates to provide generic programming	Apply
COURSE NAME: COMPUTER ORGANIZATION (C216)		
C216.1	Summarise the computer systems and different number systems, binary addition and subtraction, floating-point	Understand
C216.2	Demonstrate the organization of computer and micro operations	Apply
C216.3	Develop a detailed understanding of architecture and functionality of central processing unit	Apply
C216.4	Ability to analyze memory hierarchy and its impact on computer Cost/performance.	Analyze
C216.5	Illustrate concepts of parallel processing, pipelining and inter processor communication	Apply

COURSE NAME: PYTHON PROGRAMMING LAB (C217)		
C218.1	Apply basic features of C++ and explain object oriented programming concepts including identifying the features of C++ programming language and Apply the various OOPs concepts with the help of programs.	Apply
C218.2	Design and implement programs using C++.	Create
C218.3	Illustrate how to apply reusability in object oriented programming though C++.	Understand
C218.4	Utilize basic data structures such as arrays and linked list and Utilize various searching and sorting algorithms.	Apply
C218.5	Programs to demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.	Understand
COURSE NAME: ESSENCE OF INDIAN TRADITION AND KNOWLEDGE(C219)		
C219.1	Understand the concept of Traditional knowledge and its importance	Understand
C219.2	Know the need and importance of protecting traditional knowledge	Understand
C219.3	Know the various enactments related to the protection of traditional knowledge	Apply
C219.4	Understand the concepts of Intellectual property to protect the traditional knowledge	Understand
C219.5	Ability to analyze traditional knowledge in various sectors/engineering	Analyze
COURSE NAME: EMPLOYABILITY SKILLS - I (C2110)		
C2110.1	Recite the corporate etiquette.	Understand
C2110.2	Make presentations effectively with appropriate body language	Apply
C2110.3	Be composed with positive attitude	Apply
C2110.4	Apply their core competencies to succeed in professional and personal life	Apply
II YEAR II SEMESTER		
COURSE NAME: SOFTWARE ENGINEERING (C221)		
C221.1	Find the averages, deviation and give pictorial representation by using the given data.	Application
C221.2	Use least squares approximation to find the best fit linear curve for a given set of data points.	Application
C221.3	Construct the probability distribution of random variable, and use it to compute expectation and variance.	Apply
C221.4	Use the normal distribution to test statistical hypothesis and to compute confidence interval.	Application
C221.5	Perform and analyze hypothesis tests of means, proportions and variances using one and two sample datasets and small samples .	Evaluation
COURSE NAME: JAVA PROGRAMMING (C222)		

C222.1	Identify basic concepts of Java Programming Language	Understand
C222.2	Analyze and implement the role of packages, interfaces in program design using Java	Analyze
C222.3	Choose the basic principles of creating java Arrays, Inheritance and Interfaces.	Evaluate
C222.4	Design Java programs that uses Packages and implements Exception Handlings.	Create
C222.5	Analyze applications of Strongs and Java Multi Threading and Exception Handling .	Analyze
COURSE NAME: OPERATING SYSTEMS (C223)		
C223.1	Define various generations of Operating System and functions of Operating System.	Understand
C223.2	Analyze process scheduling algorithms and various IPC mechanisms.	Analyze
C223.3	Analyze different page replacement methods, various File management techniques.	Analyze
C223.4	Understand the process synchronization, different ways for deadlocks handling.	Understand
C223.5	Understand Linux and Android environment and behavior.	Understand
COURSE NAME: DATABASE MANAGEMENT SYSTEM (C224)		
C224.1	Understand the basic principles of database management systems.	Understand
C224.2	Draw Entity-Relationship diagrams to represent simple database application	Apply
C224.3	write SQL queries for a given context in relational database.	Apply
C224.4	Discuss normalization techniques with simple examples.	Analyze
C224.5	Describe transaction processing and concurrency control concepts.	Apply
COURSE NAME: FORMAL LANGUAGES AND AUTOMATA THEORY (C225)		
C225.1	Classify Machines by their power to Recognize Languages understanding of the Automata theory concepts such as DFA's, NFA's. Understand	Understand
C225.2	Classify the Automata theory concepts such as RE's Analyze	Analyze
C225.3	Summarize language classes & Grammars Relationship among them with the help of Chomsky hierarchy and minimize FA's and Grammars of Context Free Languages Understand	Understand
C225.4	Illustrate PDA , Deterministic PDA and non-deterministic PDA machines	Understand
C225.5	Design and solve the Turing Machine Problems , halting Problems	Create
COURSE NAME: JAVA PROGRAMMING LAB (C226)		
C226.1	Illustrate Java based software code of medium-to-high complexity .	Understand
C226.2	Design elementary modifications to Java programs that solve real	Create

	world problems.	
C226.3	Apply the basic approaches to design software applications by using an IDE to develop OOP	Apply
C226.4	Analyze applications of Java Applets & Event handling .	Analysing
C226.5	Choose the basic principles of creating java applications with Graphical user interface	Evaluate
COURSE NAME:UNIX & OPERATING SYSTEM LAB(C227)		
C227.1	To use Unix utilities and perform basic shell control of the utilities	Apply
C227.2	To use the Unix file system and file access control•	Apply
C227.3	To use of an operating system to develop software	Apply
C227.4	Students will be able to use Linux environment efficiently	Apply
C227.5	Solve problems using bash for shell scripting	Apply
COURSE NAME:JAVA PROGRAMMING LAB (C228)		
C228.1	Illustrate Java based software code of medium-to-high complexity	Understand
C228.2	Design elementary modifications to Java programs that solve real world problems	Create
C228.3	Apply the basic approaches to design software applications by using an IDE to develop OOP	Apply
COURSE NAME:PROFESSIONAL ETHICS AND HUMAN VALUES(C229)		
C229.1	Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field	Understand
C229.2	Identify the multiple ethical interests at stake in a real-world situation or practice	Understand
C229.3	Articulate what makes a particular course of action ethically defensible	Apply
C229.4	Assess their own ethical values and the social context of problems	Analyze
C229.5	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects	Apply
COURSE NAME: SOCIALLY RELEVANT PROJECT (C2210)		
C2210.1	Simulate or develop a program or prototype for his/her project	Apply
C2210.2	Analyze, compare and discuss their results and models and present his/her work to the panel	Analyze
C2210.3	Utilize conventional or latest technologies for problem solving and identify the future enhancement for the project work	Apply
C2210.4	Design models, database and test cases and use tools for testing a project	Create
C2210.5	Make use of literature survey and analyze it	Evaluate
C2210.6	build thesis or report in a required format and present their work to the panel.	Create

III YEAR I SEMESTER		
COURSE NAME: DATA WAREHOUSING AND DATA MINING (C311)		
C311.1	Design a Data warehouse system and perform business analysis with OLAP tools	Create
C311.2	Apply suitable pre-processing and visualization techniques for data analysis	Apply
C311.3	Construct frequent pattern and association rule mining techniques for data analysis	Apply
C311.4	Distinguish appropriate classification techniques for data analysis	Analyze
C311.5	Determine appropriate clustering techniques for data analysis	Evaluate
COURSE NAME: COMPUTER NETWORKS (C312)		
C312.1	Study of OSI and TCP/IP models and physical layer	Analyze
C312.2	Survey on MAC layer protocols.	Apply
C312.3	Illustration of LAN technologies and applications using internet protocols	Analyze
C312.4	Classify routing and congestion control algorithms	Evaluate
C312.5	Outline transport layer and Development of application layer protocols	Apply
COURSE NAME: COMPILER DESIGN(C313)		
C313.1	Interpret the various transformations of source language to generate Target code	Understand
C313.2	Analyze the concepts and features of a lexical analyzer.	Analyze
C313.3	Identify the techniques of Intermediate code generation .	Apply
C313.4	Build target code by using optimization and undetand the Run time environment of compiler.	Create
C313.5	Identify important issues in code generation schemes.	Apply
COURSE NAME: ARTIFICIAL INTELLIGENCE (C314)		
C314.1	Outline problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem	Understand
C314.2	Apply the language/framework of different AI methods for a given problem.	Apply
C314.3	Implement basic AI algorithms- standard search algorithms or dynamic programming	Apply
C314.4	Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports	Create
C314.5	Implement various knowledge representation techniques for acquisition and validate various structures in expert's system domain.	Apply
COURSE NAME: SOFTWARE TESTING METHODOLOGIES (C315)		

C315.1	List a range of different software testing techniques and strategies and be able to apply specific(automated) unit testing method to the projects.	Apply
C315.2	Distinguish characteristics of structural testing methods.	Analyze
C315.3	Demonstrate the integration testing which aims to uncover interaction and compatibility problems as early as possible.	Apply
C315.4	Discuss about the functional and system testing methods	Understand
C315.5	Demonstrate various issues for object oriented testing	Apply
COURSE NAME: COMPUTER NETWORKS LAB (C316)		
C316.1	Understand the basics of Physical Layer in real time applications	Understand
C316.2	Apply data link layer concepts, design issues, and protocols	Apply
C316.3	Implementation Network layer routing protocols	Apply
C316.4	Analyze the protocols of transport layer for IP addressing	Analyze
COURSE NAME: AI TOOLS & TECHNIQUES LAB(C317)		
C317.1	Identify problems that are amenable to solution by AI methods	Understand
C317.2	Apply the language/framework of different AI methods for a given problem.	Apply
C317.3	Use language/framework of different AI methods for solving problems	Apply
C317.4	Implement basic AI algorithms	Apply
C317.5	Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports problem formalization, and state the conclusions that the evaluation supports	Analyze
COURSE NAME: DATA MINING LAB (C318)		
C318.1	Design a Data warehouse system and perform business analysis with OLAP tools	Create
C318.2	Apply suitable pre-processing and visualization techniques for data analysis (Apply)	Apply
C318.3	Construct frequent pattern and association rule mining techniques for data analysis	Apply
C318.4	Distinguish appropriate classification techniques for data analysis	Analyze
C318.5	Determine appropriate clustering techniques for data analysis	Evaluate
COURSE NAME: EMPLOYABILITY SKILLS -II (C319)		
C319.1	Recite the corporate etiquette.	Understand
C319.2	Make presentations effectively with appropriate body language	Apply
C319.3	Be composed with positive attitude	Apply
C319.4	Apply their core competencies to succeed in professional and personal life	Apply
III YEAR II SEMESTER		

COURSE NAME: WEB TECHNOLOGIES (C321)		
C321.1	Illustrate the basic concepts of HTML and CSS & apply those concepts to design static web pages	Analyze
C321.2	Identify and understand various concepts related to dynamic web pages and validate them using JavaScript	Apply
C321.3	Outline the concepts of Extensible markup language & AJAX	Apply
C321.4	Develop web Applications using Scripting Languages & Frameworks	Create
C321.5	Create and deploy secure, usable database driven web applications using PHP	Create
COURSE NAME: DISTRIBUTED SYSTEMS (C322)		
C322.1	To understand the foundations of distributed systems	Understand
C322.2	Understand the various synchronization issues and global state for distributed systems	Understand
C322.3	Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems	Understand
C322.4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems	Understand
C322.5	Describe the features of peer	Apply
C322.1	To understand the foundations of distributed systems	Understand
COURSE NAME: DESIGN & ANALYSIS OF ALGORITHMS (C323)		
C323.1	Apply different ways to analyze randomized algorithms (expected running time, probability of error). Recite algorithms that employ randomization	Apply
C323.2	Summarize divide-and conquer algorithms, Demonstrate the greedy paradigm, Derive and solve recurrences describing the performance of divide and-conquer & greedy algorithms.	Understand
C323.3	Solve dynamic programming algorithms, and analyze them.	Application
C323.4	Determine the backtracking paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm.	Evaluate
C323.5	Applies the branch & bound paradigm and explain when an algorithmic design situation calls for it. Synthesize branch & bound algorithms, and analyze them	Application
COURSE NAME: INFORMATION RETRIEVAL SYSTEM (C324)		
C324.1	Describe the objectives of information retrieval systems	Understand
C324.2	Describe models like vector-space, probabilistic and language models to identify the similarity of query and document	Understand
C324.3	Implement clustering algorithms like hierarchical agglomerative clustering and k-means algorithm	Create
C324.4	Understand the method to construct thesauri automatically and	Understand

	Manually	
C324.5	Design the method to build inverted index	Create
COURSE NAME: ESSENTIALS OF ANALOG & DIGITAL ELECTRONICS (C325)		
C325.1	Explain about rectifiers , clippers and zener diode regulators.	Understand
C325.2	Analyze CDMA process and related topics of wireless communication.	Analyze
C325.3	Analyze multiple input multiple output of wireless communication.	Analyze
C325.4	Apply OFDM concepts to wireless communication.	Apply
C325.5	Explain about Satellite wireless systems like transponder and Geostationary Satellite	Understand
COURSE NAME: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (C326)		
C326.1	Define the fundamental concepts of managerial economics.	Remember
C326.2	Classify and compare various costs in managerial decision making process.	Understand
C326.3	Identify the features of different market structures and various forms of Business organisations	Apply
C326.4	Identify fundamental concepts of accounting and Analyze financial statements.	Apply
C326.5	Evaluate various alternative investment proposals to make a better capital budgeting decision	Evaluate
COURSE NAME: WEB TECHNOLOGIES LAB (C327)		
C327.1	Analyze and apply the role of languages like HTML, CSS, XML	Analyze
C327.2	Apply Web Application Terminologies, Internet Tools and web services	Apply
C327.3	JavaScript, PHP and protocols in the workings of the web and web applications	Create
C327.4	Develop and Analyze dynamic Web Applications using PHP & MySql	Create
IV YEAR I SEMESTER		
COURSE NAME: CRYPTOGRAPHY AND NETWORK SECURITY (C411)		
C411.1	Summarize various network security problems and the techniques that could be used to protect the software from security threats	Understand
C411.2	Apply various symmetric key cryptography algorithms	Apply
C411.3	Demonstrate number theory and apply it in asymmetic key cryptography algorithms	Apply
C411.4	Know how to provide security to e-mail	Understand
C411.5	Apply knowledge of cryptographic utilities & authentication mechanism to design secure applications	Apply
COURSE NAME: UML & DESIGN PATTERNS (C412)		
C412.1	Examine the concepts of object oriented modelling using UML.	Understand

C412.2	Analyze the software problem using UML Diagram.	Analyze
C412.3	Design the solution for the software application using UML Diagrams.	Create
C412.4	Demonstrate the design patterns to solve design problems.	Understand
C412.5	Apply the suitable design patterns to solve design problems.	Apply
COURSE NAME: MACHINE LEARNING (C413)		
C413.1	Analyze a learning system for a given problem	Analyze
C413.2	Solve different problems in Decision Tree Learning and evaluate its performance	Evaluate
C413.3	Apply Dimensionality Reduction techniques	Apply
C413.4	Build application using Artificial Neural Networks and Support Vector Machines	Create
C413.5	Apply probability theory in learning algorithms	Apply
COURSE NAME: EMBEDDED SYSTEMS (C414)		
C414.1	Understand the basic concepts of an embedded system and know the characteristics of an embedded system.	Understand
C414.2	Explain the components required for an embedded system.	Understand
C414.3	Analyse various embedded firmware design approaches on embedded environment.	Analyze
C414.4	Discuss the operating system basics and its components, list operating systems and know hardware software co-design.	Understand
C414.5	Describe the embedded system development tools and learn the testing process.	Understand
COURSE NAME: SOFTWAR PROJECT MANAGEMENT (C415)		
C415.1	Apply the process to be followed in the software development life-cycle models	Apply
C415.2	Apply the concepts of project management & planning	Apply
C415.3	Implement the project plans through managing people, communications and change	Create
C415.4	Conduct activities necessary to successfully complete and close the Software projects	Understand
C415.5	Implement communication, modeling, and construction & deployment practices in software development	Create
COURSE NAME: CLOUD COMPUTING (C416)		
C416.1	Interpret the key dimensions of the challenge of Cloud Computing.	Understand
C416.2	Examine the economics, financial, and technological implications for selecting cloud computing for own organization	Apply
C416.3	Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based	Evaluate

	applications.	
C416.4	Evaluate own organizations' needs for capacity building and training in cloud computing related IT areas	Evaluate
C416.5	Illustrate Virtualization for Data-Center Automation.	Apply
COURSE NAME: UNIFIED MODELLING LANGUAGE LAB (C417)		
C417.1	Identify Events, Usecases and domain classes of a software system	Apply
C417.2	Analyze Software Requirements for the given Software Application.	Analyze
C417.3	Develop Design solutions for software systems using UML & Design patterns	Create
C417.4	Create software code from UML diagrams	Create
C417.5	Test and document the artifacts of a software systems	Create
COURSE NAME: SOFTWARE TESTING LAB (C418)		
C418.1	Simulate or develop a program or prototype for his/her project	Apply
C418.2	Analyze,compare and discuss their results and models and present his/her work to the panel	Analyze
C418.3	Utilize conventional or latest technologies for problem solving and identify the future enhancement for the project work	Apply
C418.4	Design models, database and test cases and use tools for testing a project	Create
C418.5	Make use of literature survey and analyze it	Evaluate
C418.6	build thesis or report in a required format and present their work to the panel	Create
COURSE NAME: IPR & PATENTS (C419)		
C419.1	Illustrate IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents	Understand
C419.2	Student can illustrate Copyrights and copyright laws	Understand
C419.3	Explain patent registration, patent grant and patent laws	Understand
C419.4	Explore trademark registration, trade mark grant and trademark laws	Understand
C419.5	Analyse Trade Secrets & Cyber Law and Cyber Crime.	Analyze
IV YEAR II SEMESTER		
COURSE NAME: MANAGEMENT & ORGANIZATIONLA BEHAVIOUR (C421)		
C421.1	Explain the fundamental concepts of management and organization	Understand
C421.2	Identify the functional areas of management	Apply
C421.3	Examine various elements of strategic management	Analysing
C421.4	Find the impact of motivation and other feators which shape idividual behaviour	Remember

C421.5	Interpret the strategies for effective management of groups, culture and conflicts in an organization	Understand
COURSE NAME: ENVIRONMENTAL POLLUTION & CONTROL (C422)		
C422.1	Identify the air pollutant control devices	Remember
C422.2	Have knowledge on the NAAQ standards and air emission stand	Remember
C422.3	The treatment techniques used for sewage and industrial wastewater treatment methods. .	Analyze
C422.4	The fundamentals of solid waste management, practices adopted in his town/village and its importance in keeping the health of the city.	Understand
C422.5	The importance of sustainable development while planning a project or executing an activity.	Create
COURSE NAME: DEVOPS (C423)		
C423.1	Recall the Concepts of various Software development models	Remember
C423.2	Demonstrate DevOps & Dev SecOps methodologies and their key concepts .	Understand
C423.3	Apply devops tools for continuous integration and Continuous deployment	Apply
C423.4	Create the devops pipeline to automate the entire development process	Create
C423.5	Examine Key factors and stages of DevOps maturity model	Analyze
COURSE NAME: PROJECT –II (C424)		
C424.1	Simulate or develop a program or prototype for his/her project	Apply
C424.2	Analyze, compare and discuss their results and models and present his/her work to the panel	Analyze
C424.3	Utilize conventional or latest technologies for problem solving and identify the future enhancement for the project work	Apply
C424.4	Design models, database and test cases and use tools for testing a project	Create
C424.5	Make use of literature survey and analyze it	Evaluate
C424.6	build thesis or report in a required format and present their work to the panel	Create

Vijayalaxmi

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