BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

Department of Electrical & Electronics Engineering

COURSE OUTCOMES

R16 REGULATION

I YEAR I SEMESTER

CO CODE	COURSE OUTCOME	TAXONOMY LEVEL
	COURSE NAME:ENGLISH-I(C111)	
C111.1	Classify and compare different resources to serve the needs of the society in different ways.	Application
C111.2	Apply road safety measures in day to day life in different modes of transport and write paragraphs effectively.	Analysing
C111.3	Apply science and technology in inventing latest engineering tools to discern their advantages and disadvantages.	Creating
C111.4	Choose viable and alternative sources of energy to tide over the crisis of depleting sources.	Evaluating
C111.5	Explain the importance of bio-diversity and ecological balance like preservation of Flora and Fauna and develop writing skills.	Understanding
C111.6	Discover various safety measures against hazards at home, labs, industry and work places as well and familiarize themselves with office etiquette & ethics.	Analysing
	COURSE NAME:MATHEMATICS-I (C112)	
C112.1	Solve the first order differential equations and able to apply physical problems.	Applying
C112.2	Solve higher order linear differential equations with constant coefficients.	Applying
C112.3	Find the Laplace transform of functions and evaluation of integrals and invers Laplace transform of different functions and solve the differential equations using Laplace transform.	Applying
C112.4	Find the partial derivative of different orders, finding maxima and minima of function of two variable, three variables and functional dependence.	Applying
C112.5	Find the partial derivative by elimination of arbitrary function and arbitrary constant.Solve the linear and non-linear PDE's.	Applying
C112.6	Solve the partial differential equations using homogenous and non homogenous.	Applying
	COURSE NAME:APPLIED CHEMISTRY (C113)	
C113.1	Analyze the concept of improvement of impact strength of plastic materials.	Analysing
C113.2	Make use of electrochemical series while preparing different cells.	Applying
C113.3	Analyze and interprets the formation of different nano materials.	Analysing
C113.4	Explain different forms of energy in atoms and molecules change upon interacting with electromagnetic radiation.	Applying
C113.5	Utilizes the non- conventional energy resources purposefully.	Understanding
C113.6	Obtain the knowledge of computational chemistry and molecular machines.	Remembering
	COURSE NAME:ENGINEERING MECHANICS (C114)	
C114.1	Explain the force concepts, Resultant of Force Systems and Friction.	Applying
C114.2	Develop FBD's, Explain spatial system of forces and Define various laws and Theorems.	Applying
C114.3	Demonstrate concepts of centroid and centre of gravity.	Applying
C114.4	Illustrate Area, Polar and Mass moment of Inertia and their applications.	Applying
C114.5	Explain motion in straight line and in curvilinear paths and plane motion.	Applying
C114.6	Explain Work-Energy and applications, fixed axis rotation, Impulse momentum method.	Applying
	COURSE NAME:COMPUTER PROGRAMMING (C115)	

C115.1	Demonstrate the basic components and software's used in computer programming language.	Understanding
C115.2	Develop and compile and debug programs in C language and Demonstrate syntaxes, predefine functions & operators in computer programming language.	Applying
C115.3	Build the c programs involving decision making statements, looping statements and understand the control flow of the program.	Applying
C115.4	Choose Functions and Recursion concepts to solve the complex c programs.	Evaluating
C115.5	Discuss arrays, strings and develop c programs using string manipulation functions.	Analysing
C115.6	Analyze different file handling functions and dynamic memory management functions .	Analysing

COURSE NAME:ENVIRONMENTAL STUDIES (C116)

C116.1	Explain the eco system and it's function in the environment.	Understanding
C116.2	Aware the importance of natural resources and it's conversation.	Understanding
C116.3	Analyse the diversity of life on earth and it's importanse.	Analyzing
C116.4	Execute different programmes in eco friendly way.	Applying
C116.5	Describe the different laws to protect our environment.	Analyzing
C116.6	Conduct Research in safe and Responsible manners communicating the environmental subject more effectively.	Applying

COURSE NAME: APPLIED/ ENGINEERING CHEMISTRY LABORATORY(C117)

C117.1	Determine Wavelength of a source and radius of curvature of convex lens	Understanding
C117.2	Determine regidity modulus of a material	Analyzing
C117.3	Determine accelaration due to gravity	Applying
C117.4	Verify laws of vibrations and melds law	Analyzing
C117.5	Study the characteristics of diode	Analyzing
C117.6	Characteristics of Semiconductor	Analyzing

COURSE NAME: ENGLISH COMMUNICATION SKILLS LABORATORY-I(C118)

C118.1	Explain why study spoken English is important to become successful in the competitive world and situational dialogues.	Understanding
C118.2	Construct appropriate sentences for requests, asking for and giving permissions, asking for and giving directions in live situations.	Applying
C118.3	Choose appropriate phrases for inviting, complaining, congratulating, apologizing, advising, suggesting, agreeing and disagreeing and expressing sympathy.	Evaluating
C118.4	Demonstrate the basics of English phonetics and the lack of one to one correspondence between the alphabet and the sounds of English.	Understanding
C118.5	Make use of International Phonetic Alphabet in order to improve pronunciation while Speaking and Listening.	Applying
C118.6	Categorize the principles of silent letters and pronunciation of inflections, stress and intonation in English.	Analyzing

COURSE NAME: COMPUTER PROGRAMMING LABORATORY(C119)

C119.1	Demonstrate the basic components and softwares used in computer programming language.	Understanding
C119.2	Develop and compile and debug programs in c language and demonstrate syntaxes,predefined functions and operators in computer programming language.	Applying
C119.3	Build the c programs involving decision making statements, looping statement and understand the control flow of the program.	Creating
C119.4	Students will able to choose functions and recursion concepts to solve the complex c programs.	Evaluating
C119.5	Discuss arrays, strings and develop c programs using string manipulation functions.	Creating
C119.6	Analyse different file handling functions and dynamic memory management functions.	Analyzing

I YEAR II SEMESTER

COURSE NAME: ENGLISH-II (C121)

C121.1	Relate the very purpose of education is to enhance knowledge and wisdom.	Understanding
C121.2	Develop global harmony and peaceful co-existence among people and society.	Applying
C121.3	Discover different cultures due to globalization and manage different cultural shocks.	Analyzing
C121.4	Examine out-dated traditions in society with the application of wisdom.	Applying

C121.5	Compare and contrast various protective measures of environment for peaceful existence of future generations and learn report writing for media.	Applying
C121.6	Select the eminent personalities and build luminous future successfully with their inherent passion, interest and burning desire in their areas of interests.	Applying
	COURSE NAME: MATHEMATICS-II(C122)	
C122.1	Solve the algebraic and transcendental equations by different methods.	Applying
C122.2	Solve the different interpolation formulae to find a polynomial or the value of the polynomial at a given point. (Application)	Evaluating
C122.3	Find the Quadrature, the solutions of ordinary differential equations by different formulae. (Evaluation)	Applying
C122.4	Interpret a function as a Fourier series dirichlet's conditions. (Application)	Applying
C122.5	Solve the problems on Fourier transforms using real and complex functions. (Application)	Applying
C122.6	Demonstrate capacity to mode physical phenomena using PDE's and to apply problem solving using concepts and techniques from PDE and Fourier analysis applied to diverse situation in physics, engineering mathematics. (Application)	Applying
	COURSE NAME: MATHEMATICS-III(C123)	
C123.1	Find Rank and Solve the linear system of equations by using different methods.	Applying
C123.2	Find the eigen values and eigen vectors and also finding inverse and power of a matrix by using Cayley Hamilton theorem. And also diagonalise the matrix by using various methods. Finding Rank, Index, Signature and Nature of a Quadratic form.	Remembering
C123.3	Tracing the curve for the given equation, evaluate the double and triple integrals by direct methods, change of order of integration and change of variables.	Analyzing
C123.4	Evaluate the given integrals by using Beta and Gamma functions.	Evaluating
C123.5	Find the gradient of a scalar field, divergence and curl of vector field and vector identities.	Remembering
C123.6	Evaluate the line, surface and volume integrals. Solve the problems using Vector integral theorems.	Evaluating
	COURSE NAME:APPLIED PHYSICS(C124)	
C124.1	Explain the physical significance of optics and hence estimate the speed of light ,wave length ,refractive index by using interference.	Understanding
C124.2	Explain the resolving power of various optical instruments like grating, teliscope and micro scope.	Understanding
C124.3	Explain about polarized light and optical actvity using polarization and describe the construction and working of various lasers.	Understanding
C124.4	Develope various engineering applications involving electro magnetic fields.	Analyzing
C124.5	Apply the knowledge of basic quantum mechanics and summarize the importance of free electrons in determing the properties of metals.	Applying
C124.6	Classify materials as metals, insulators, semiconductors and explain the properties of semiconductors with application to the hall effect.	Analyzing
	COURSE NAME:ELECTRICAL CIRCUIT ANALYSIS-I(C125)	
C125.1	Apply the solution methods such as nodal analysis and mesh analysis	Applying
C125.2	Solve circuits using tree, node, branch, cut set, tie set methods.	Applying
C125.3	Discuss magnetic circuits concepts.	Remembering
C125.4	Apply ac circuits concepts to find various performance parameters of electrical network.	Analyzing
C125.5	Explain single phase circuit concepts to obtain locus diagrams and resonance.	Applying
C125.6	Evaluate various networks by using principles of network theorems.	Evaluating
	COURSE NAME:ENGINEERING DRAWING(C126)	
C126.1	Classify the basic concepts, methodologies of engineering drawing, visualize and construct curved profiles in developing new products like gears and other engineering applications.	Understanding
C126.2	Construct various types of scales for engineering application like maps, buildings, bridges.	Applying

C126.3	Analyse the concept of projections involving points and lines.	Analysing
C126.4	Analyse the theory of projection in planes and apply in manufacturing processes.	Analysing
C126.5	Analyse the concept of projection of solids inclined to both the planes.	Analysing
C126.6	Develop the orthographic projections and imagine the components by isometric projection by representing three dimensional objects in 2D in technical and engineering drawings.	Applying
	COURSE NAME:ENGLISH COMMUNICATION SKILLS LABORATORY-II(C127)	
C127.1	Demonstrate how to speak politely and effectively with supporting facts/points against the speakers who are taking the opposing views.	Understanding
C127.2	Analyze the given topic, share the information and opinions and act efficiently as an individual and team member.	Analyzing
C127.3	Select a suitable presentation with proper presentational aids to present the information.	Applying
C127.4	Develop an idea about various kinds and stages of interviews to face interviews confidently.	Applying
C127.5	Apply techniques to write Curriculum Vitae and E-mails to suit different contexts.	Applying
C127.6	Make use of idiomatic expressions of English in Speech and Writing and minimize common errors in usage of English.	Applying
	COURSE NAME:APPLIED / ENGINEERING PHYSICS LABORATORY(C128)	
C128.1	Determine Wavelength of a source and radius of curvature of convex lens	Understand
C128.2	Determine regidity modulus of a material	Understand
C128.3	determine accelaration due to gravity	Analyzing
C128.4	verify laws of vibrations and melds law	Analyzing
C128.5	Study the characteristics of diode	Analyzing
C128.6	Study Characteristics of Semiconductor	Analyzing
	COURSE NAME: APPLIED/ENGINEERING PHYSICS- VIRTUAL LAB-ASSIGNMENTS(C129)	
C129.1	Explain the slit width, wavelength using LASER	Understanding
C129.2	Explain the Numerical Aperture by using optical fiber.	Understanding
C129.3	Verify the photo electric effect.	Understanding
C129.4	Verify the laws of Damped oscillations and simple pendulum	Understanding
C129.5	Determining the value by using B-H curve and Hysteresis	Understanding
C129.6	Determining the value by using Hall effect.	Understanding
	COURSE NAME:ENGG WORKSHOP & IT WORKSHOP(C1210)	
C1210.1	Prepare various joins with the available work materials.	Creating
C1210.2	Understand and connects diffreent circuits in housewiring.	Understanding
C1210.3	Identify the peripherals of computer,installation and assembling,disassembling.	Analysing
C1210.4	Identification&fix a problem and demonstrating importance of network.	Applying
C1210.5	Demonstrate search engines&cyber hygiene.	Understanding
C1210.6	Creating a project with MS office.	Creating
	II YEAR I SEMESTER	
	COURSE NAME: ELECTRICAL CIRCUIT ANALYSIS-II (C211)	
C211.1	Solve the three-phase circuits under balanced load condition	Evaluating
C211.2	Solve the three-phase circuits under unbalanced load condition.	Understanding
C211.3	Analyse the transient behavior of electrical networks with DC, Pulse and AC excitations.	Analyzing
C211.4	Calculate the parameters of a network based on input and Output excitation/response.	Evaluate
C211.5	Calculate the parameters of a network based on input and Output excitation/response.	Creating
C211.6	Analyse the electrical circuits by applying Fourier series and Fourier Transform.	Analyzing
	COURSE NAME:ELECTRICAL MACHINES-I(C212)	
C212.1	Able to assimilate the concepts of electromechanical energy conversion	Understanding
C212.2	Able to mitigate the ill-effects of armature reaction and improve commutation in dc machines.	Understanding
C212.3	Able to understand the torque production mechanism and control the speed of dc motors	Evaluating

C212.4	Able to analyze the performance of single phase transformers	Understanding
C212.5	Able to predetermine regulation, losses and efficiency of single phase transformers.	Understanding
C212.6	Able to parallel transformers, control voltages with tap changing methods and achieve three-phase to two-phase transformation	Evaluating
	COURSE NAME:BASIC ELECTRONICS&DEVICES (C213)	
Faculty Name: M.Adi Lakshmi Devi		
C213.1	Students can able to learn the basics of semiconductor physics.	Remembering
C213.2	Students can able to study the construction details, operation and characteristics of various semiconductor diodes.	Understanding
C213.3	Students can able to understand the operation and analysis of rectifiers with and without filters. Further study the operation of series and shunt regulators using zener diodes..	Creating
C213.4	Students can able to study the characteristics of different bipolar junction transistors and their biasing stabilization and compensation techniques and analyze transistor amplifiers using h-parameters..	Analyzing
C213.5	Students can able to understand the basics of FET,Thyristors, Power IGBTs and Power MOSFETs.	Evaluating
C213.6	Students can able to understand the concepts of positive and negative feedbacks and their role in amplifiers and oscillators.	
	COURSE NAME:ELECTROMAGNETIC FIELDS(C214)	
C214.1	Apply vector calculus to static electric - magnetic fields in different engineering situations.	Applying
C214.2	Design and calculate the capacitance values and energy stored in dielectrics.	Creating
C214.3	Evaluate the magnetic field intensity due to current and the application of ampere's law and to analyze maxwell's equation in different form.	Evaluating
C214.4	Assess the magnetic forces and torque produced by current in magnetic field.	Evaluating
C214.5	Solve problems involving self and mutual inductances and energy stored in magnetic fields.	Creating
C214.6	Examine Maxwell's equations in time varying Electromagnetic fields.	Analyzing
	COURSE NAME: THERMAL & HYDRO PRIME MOVERS(C215)	
C215.1	Apply the Otto, diesel cycles for finding the performance of S.I andC.Iengine.	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.	Creating
C215.5	compare the constructional features, operational details of various types of hydraulic turbines.	Analyzing
C215.6	Identify the main components of hydro electric power plants.	Applying
	COURSE NAME:MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS(C216)	
C216.1	Interpret the fundamental concepts of managerial economics.	Understanding
C216.2	Classify and compare various costs in managerial decision making process.	Analyzing
C216.3	Analyse different kinds of markets and various pricing strategies.	Analyzing
C216.4	Identify various forms of business optimization and their procedures	Applying
C216.5	Identity fundamental concepts of accounting and analyse financial statements.	Analyzing
C216.6	Identity fundamental concepts of accounting and analyse financial statements.	Evaluating
	COURSE NAME:: THERMAL AND HYDRO LABORATORY(C217)	
C217.1	Measure the impact of jet on different types of plates	Evaluating
C217.2	Determine the co-efficient of discharge of an Orifice meter & Venturimeter	Applying
C217.3	Conduct the performance test on a Single stage centrifugal pump & Reciprocating pump	Applying
C217.4	Conduct the performance test on a twin cylinder diesel engine & multi cylinder engine	Applying
C217.5	Conduct Heat balance test, Morse test & Retardation Test	Analyzing
C217.6	Determine the valve timing diagram of SI engine & CI engine	Evaluating
	COURSE NAME: ELECTRICAL CIRCUITS LABORATORY (C218)	
C218.1	verify and demonstrate various theorems.	Evaluating

C218.2	Determine self and mutual inductance of a magnetic circuit, parameters of a given coil and measurement of 3- phase power.	Remembering
C218.3	verify locus diagrams, resonance and two port networks.	Analyzing

II YEAR II SEMESTER

COURSE NAME: ELECTRICAL MEASUREMENTS (C221)

C221.1	1.Are you able to measure voltage and current by using different types of instruments?	Understanding
C221.2	2.Did you able to understand working princples of different types of measuring instruments to measure power and energy?	Understanding
C221.3	3.Are you able to understand working princples of DC and AC potentio meters?	Evaluating
C221.4	4.Are you able to understand working princples of various bridges to measure inductance restitance and capacitance?.	Applying
C221.5	5.Are you able to understand working princples of various magnetic measuring instruments?	Analyzing
C221.6	6.Did you able to apply CRO for findout unknown frequency and phase difference?	Applying

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.	Analyzing
C222.3	understand the torque producing mechanism of a single phase induction motor.	Applying
C222.4	understand the principle of emf generation, the effect of armature reaction and predetermination of voltage regulation in synchronous generators.	Creating
C222.5	study parallel operation and control of real and reactive powers for synchronous generators.	Creating
C222.6	understand the operation, performance and starting methods of synchronous motors.	Understanding

COURSE NAME: SWITCHING THEORY & LOGIC DESIGN (C223)

C223.1	Recall the number systems and basic logic operations	Remembering
C223.2	Demonstarte Boolean theorems minimization of functions using K-map and Tabulation Method	Understanding
C223.3	Analyze various combinational circuits by applying the acquired knowledge in K-maps and logic gates.	Applying
C223.4	Classify PROM,PAL,PLA and compare their Merits and Demerits	Understanding
C223.5	Analyze various Synchrounous ,Asynchronous Counters and Registers	Creating
C223.6	Analyze Clocked sequential circuits state diagrams and state tables.	Analyzing

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 Model the transfer function of physical systems, determination of overall transfer function using block diagram algebra and signal flow graphs. (Apply).	Applying
C224.2	Determine the time response specifications of second order systems and to estimate the error constants. (Evaluating)	Evaluating
C224.3	Analyze absolute stability and relative stability of LTI systems using Rout's stability criterion and root locus method. (Analyzing)	Analyzing
C224.4	Analyze stability of LTI systems using frequency response methods. (Analyzing)	Analyzing
C224.5	Able to design Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram. (Creating)	Creating
C224.6	To model the physical systems as state models and to determine their system response to judge systems controllability and observability. (Applying)	Applying

COURSE NAME: POWER SYSTEMS-I (C225)

C225.1	Demonstrate the general layout, major equipments and auxiliaries in thermal power station.	Understanding
C225.2	Explain the general layout, major equipments and different types of reactors in nuclear power	Understanding
C225.3	Solve the different types of distribution systems	Analyzing
C225.4	Compare the air and gas insulated substations	Creating
C225.5	Identify the single, multi core cables with different insulating materials.	Understanding

C225.6	Analyze the different economic factors of power generation and Calculation of tariff for different customers.	Analyzing
	COURSE NAME: MANAGEMENT SCIENCE (C226)	
C226.1	Explain the management functions and decision making process.	Understanding
C226.2	Analyse the materials management and inventory management techniques.	Analyzing
C226.3	Explain the concepts of functional management and marketing management.	Understanding
C226.4	Solve the concepts of project management problems.	Applying
C226.5	Interpret the concepts of strategic management.	Understanding
C226.6	Evaluate energy consumption levels at various modes of operation.	Creating
	COURSE NAME: ELECTRICAL MACHINES-I LABORATORY(C227)	
C227.1	Determine the magnetic characteristics of DC Shunt generator and understand the the mechanism of self excitation.	Applying
C227.2	Determine performance of DC machines and Transformers	Applying
C227.3	Control the speed of DC motor using armature control and field control methods	Creating
C227.4	Predetermine the efficiency of transformers, DC shunt motor and assess their performance	Applying
C227.5	Obtain three phase to two phase transformation	Applying
C227.6	Obtain seperation of losses of single phase transformer and DC shunt motor	Applying
	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

III YEAR I SEMESTER

	COURSE NAME: POWER SYSTEMS-II (C311)	
C311.1	Analyze the parameters of various types of transmission lines during various conditions.	Analysing
C311.2	Understand the performance of short and medium transmission lines in power systems	Understanding
C311.3	Understand the performance of long transmission lines in power systems	Evaluating
C311.4	Understand travelling waves on transmission line	Analysing
C311.5	Understand the various factors related to charge on transmission lines	Remembering
C311.6	understand sag/tension of transmission lines and performance of insulators insulators.	Creating
	COURSE NAME:RENEWABLE ENERGY SOURCES (C312)	
C312.1	selecting a suitable motor for electric drives with respect to loading conditions	Analyzing
C312.2	Employ the most appropriate heating and welding techniques for industrial applications.	Creating
C312.3	Distinguish the entities in the illumination systems and their units and measurement of illumination	Creating
C312.4	Design interior and exterior lighting systems and illumination levels for various purposes of light fittings.	Understanding
C312.5	Distinguish the different schemes of traction and its main components.	Evaluating
C312.6	Evaluate energy consumption levels at various modes of operation.	Understanding
	COURSE NAME: SIGNALS & SYSTEMS (C313)	
C313.1	selecting a suitable motor for electric drives with respect to loading conditions	Understanding
C313.2	Employ the most appropriate heating and welding techniques for industrial applications.	Analyzing
C313.3	Distinguish the entities in the illumination systems and their units and measurement of illumination.	Understanding
C313.4	Design interior and exterior lighting systems and illumination levels for various purposes of light fittings.	Creating
C313.5	Distinguish the different schemes of traction and its main components.	Analyzing
C313.6	Evaluate energy consumption levels at various modes of operation.	Analyzing

	COURSE NAME: PULSE & DIGITAL CIRCUITS (C314)	
C314.1	Analyze and design linear wave shaping circuits.	Analyzing
C314.2	Analyze and design Non-linear wave shaping circuits.	Analyzing
C314.3	Recall the characteristics of various switching devices such as diode and transistor.	Remembering
C314.4	Design Multivibrators for various applications.	Creating
C314.5	Design Time base generators for various applications and to show synchronization techniques and explains the sweep circuits.	Creating
C314.6	Build the basic sampling gates and their types and their applications and to realize different logic gates and analyzing the outputs.	Applying
	COURSE NAME: POWER ELECTRONICS (C315)	
C315.1	Analyze the characteristics of various power semiconductor devices and to model the firing and protecting circuits for power semiconductor devices	Creating
C315.2	Develop the single phase converters for different loads and to evaluate the converters performance by analyzing different electrical parameters	Analyzing
C315.3	Justify the three phase full converters for different loads and to distinguish between single phase and three phase converters.	Analyzing
C315.4	Develop and study the performance characteristics of various DC to DC Converters and to derive the suitable formulae for mathematical approximation	Creating
C315.5	Assess the working of various inverters and evaluate the PWM techniques for voltage control and harmonic mitigation	Evaluating
C315.6	Design a suitable AC to AC regulator for variable AC supply requirements for different applications	Creating
	COURSE NAME: ELECTRICAL MACHINES-II LAB (C316)	
C316.1	Obtain the performance of three phase induction motor by conducting brake test	Evaluating
C316.2	Compute the Equivalent Circuit paramerters of three phase & single phase Induction Motors	Applying
C316.3	Obtain the control of speed of three phase induction motor.	Applying
C316.4	Predetermine the regulation of three-phase alternator by various methods.	Applying
C316.5	Determine the Xd/ Xq ratio of alternator and asses the performance of three-phase synchronous motor	Applying
C316.6	Evaluate the power factor improvement of single phase induction motor	Applying
	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	Able to design Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram	Creating
	COURSE NAME: ELECTRICAL MEASUREMENTS LABORATORY(C318)	
C318.1	Calibrate single phase energy meter ,power factor meter	Applying
C318.2	calibrate watt meter and energy meter	Applying
C318.3	Measurement of choke coil parameters	Applying
C318.4	Testing of transformer oil by using H.T test kit	Applying
C318.5	Meaurement of resistance by using kelvin double bridge	Applying
C318.6	Measurrement of capacitance by using schering bridge	Applying
	COURSE NAME: IPR & PATENTS (C319)	
C319.1	Interpret the Concept of IPR Importance and mechanisms.	Understanding
C319.2	Utilize knowledge regarding copyrights to get them registered.	Applying
C319.3	Identify the filing procedure of patents and role of Patent Cooperation Treaty.	Applying
C319.4	Analyze rights and responsibilities of holder of Trademarks and Likelihood of Confusion - Dilution of Ownership.	Analyzing
C319.5	Illustrate the concepts of trade secrets and cyber laws.	Understanding
	III YEAR II SEMESTER	
	COURSE NAME: POWER ELECTRONIC CONTROLLERS & DRIVES (C321)	

C321.1	Summarize the concepts of conventional DC drive	Understanding
C321.2	Analyze the performance of various semi-conductor controlled DC drives	Analyzing
C321.3	Identify and enhance uses of dc drive in modern applications	Applying
C321.4	Analyze the performance of AC motors with various control strategies	Analyzing
C321.5	Interpretation of AC drive systems	Evaluating
C321.6	Identify the suitability of control methods of AC Drives for industrial applications	Applying
	COURSE NAME: POWER SYSTEM ANALYSIS (C322)	
C322.1	Able to understand the per unit system and draw impedance diagram for a power system network.	Creating
C322.2	Analyse load flow computations and load flow results using different methods.	Evaluating
C322.3	Formulate Y-bus and Z-bus for power system network.	Creating
C322.4	Interpret a network under both balanced and unbalanced fault condition and interpret result to provide the data for design of protecting devices	Understanding
C322.5	Examine positive sequence, negative sequence and zero sequence system and fault analysis	Analyzing
C322.6	Examine positive sequence, negative sequence and zero sequence system	Analyzing
	COURSE NAME: MICRO PROCESSOR & MICRO CONTROLLERS (C323)	
C323.1	Illustrate The 8086 Architecture and Register organization ,Pin diagram and general bus operations, compare 8086 with xxx86	Understanding
C323.2	Classify The Addressing modes and Instruction set, Minimum mode and maximum mode of 8086	Understanding
C323.3	Apply Various interfacing modules like 8255, A to D converters, Interfacing 8257, IO devices and Key board interface with 8086	Applying
C323.4	Summarize The 8051 Micro Controller Architecture, timers, types of instructions and various modules.	Understanding
C323.5	Illustrate The PIC registers, serial IOs, architecture.	Understanding
C323.6	Develop different types of logical operations and data conversions with the help of I/O programming.	Creating
	COURSE NAME: DATA STRUCTURES (C324)	
C324.1	Describe the basic concepts of data structures and algorithms. (Remembering)	Remembering
C324.2	Interpret arrays, stack, queue operations and applications (Understanding).	Understanding
C324.3	Select the appropriate data structure choosing given problem (Applying)	Evaluating
C324.4	Solve problem involving trees (Applying).	Creating
C324.5	Analyze different paths algorithms related graphs. (Analyzing)	Analyzing
C324.6	Apply Algorithm for solving problems like sorting, searching (Applying)	Creating
	COURSE NAME: OOPS THROUGH JAVA(C325)	
C325.1	Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.	Understanding
C325.2	Identify classes, objects, members of a class and the relationships among them needed for finding the solution to a specific problem	Applying
C325.3	Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.	Understanding
C325.4	Make use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.	Applying
C325.5	Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events	Creating
C325.6	Identify, Design & develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture	Applying
	COURSE NAME: POWER ELECTRONICS LAB(C326)	
C326.1	Able to Understand the Characteristics of Thyristor, MOSFET & IGBT.	Analysing
C326.2	Able to Design and development of a firing circuits for Thyristor and IGBT.	Evaluating
C326.3	Able to Investigate the performance of Single -Phase Half controlled and Full controlled	Evaluating
C326.4	Able to describe the performance of AC Voltage Regulator and square wave bridge inverter with R and RL Loads	Creating

C326.5	Able to Verify the voltage gains of Boost converter and buck converter in CCM & DCM operation.	Applying
	COURSE NAME: MICROPROCESSORS AND MICROCONTROLLERS LAB (C327)	
C327.1	Understand the fundamentals of assembly level programming of microprocessors microcontrollers knowledge	Understanding
C327.2	Apply the programming knowledge for arithmetic and logical operations in 8086	Applying
C327.3	Develop the programs for string manipulation programs Application	Applying
C327.4	Contrast how different I/O devices can be interfaced to processor And will explore several techniques of interfacing	Analyzing
C327.5	Apply the programming knowledge for understanding of communication standards in 8051	Applying
	COURSE NAME: DATA STRUCTURES LAB(C328)	
C328.1	Describe the basic concepts of data structures and algorithms. (Remembering).	Understanding
C328.2	Interpret arrays, stack, queue operations and applications (Understanding)	Analyzing
C328.3	Select the appropriate data structure choosing given problem (Applying)	Evaluating
C328.4	Solve problem involving trees (Applying)	Creating
C328.5	Analyze different paths algorithms related graphs. (Analyzing)	Analyzing
C328.6	Apply Algorithm for solving problems like sorting, searching (Applying)	Creating
	COURSE NAME: PROFESSIONAL ETHICS & HUMAN VALUES (C329)	
C329.1	Define the basic insights and inputs to the student on ethics, values,morals,	Remembering
C329.2	Explain the ethical responsibilities of engineers.	Understanding
C329.3	Demonstrate the knowledge on engineering as a social experimentation.	Understanding
C329.4	Create the awareness about safety,risk,risk benefit analysis.	Creating
C329.5	Develop knowledge about global issues and environmental ethics .	Creating

IV YEAR I SEMESTER

	COURSE NAME: UTILISATION OF ELECTRICAL ENERGY (C411)	
C411.1	selecting a suitable motor for electric drives with respect to loading conditions	Remembering
C411.2	Employ the most appropriate heating and welding techniques for industrial applications.	Remembering
C411.3	Distinguish the entities in the illumination systems and their units and measurement of illumination	Analyzing
C411.4	Design interior and exterior lighting systems and illumination levels for various purposes of light fittings.	Creating
C411.5	Distinguish the different schemes of traction and its main components.	Analyzing
C411.6	Evaluate energy consumption levels at various modes of operation.	Remembering
	COURSE NAME: LINEAR IC APPLICATIONS (C412)	
C412.1	Understand the basic operation &performance parameters of differential amplifiers	Applying
C412.2	Design circuits using operational amplifiers for various applications.	Understanding
C412.3	Design and Diagnose and trouble-shoot linear electronic circuits.	Applying
C412.4	Analyze and design amplifiers and active filters using Op-amp.	Analyzing
C412.5	Design circuits using 555 Timer IC & Analog Multiplier IC for various applications	Understanding
C412.6	Analyze and design Analog to Digital Ic and Digital to Analog Ics for various applications	Analyzing
	COURSE NAME: POWER SYSTEM OPERATION & CONTROL (C413)	
C413.1	Compute optimal scheduling of Generators.	Understanding
C413.2	Elaborate hydrothermal scheduling	Creating
C413.3	Discuss the unit commitment Problem	Remembering
C413.4	Distinguish the load frequency control for single area system with and without controllers	Applying
C413.5	Contrast the load frequency control for two area system with and without controllers	Evaluating
C413.6	Explore reactive power control in power systems and compensation of transmission lines	Creating
	COURSE NAME: SWITCH GEAR & PROTECTION (C414)	
C414.1	selecting a suitable motor for electric drives with respect to loading conditions	Understanding
C414.2	Employ the most appropriate heating and welding techniques for industrial applications.	Understanding

C414.3	Distinguish the entities in the illumination systems and their units and measurement of illumination.	Remembering
C414.4	Design interior and exterior lighting systems and illumination levels for various purposes of	Understanding
C414.5	Distinguish the different schemes of traction and its main components.	Understanding
C414.6	Evaluate energy consumption levels at various modes of operation..	Understanding
	COURSE NAME: INSTRUMENTATION (C415)	
C415.1	Knowing about various types of signals and representing them	Understanding
C415.2	learn knowledge about various kinds of transducers like mechanical ,electrical, electro mechanical and optical transducers	Remembering
C415.3	measurement of non electrical quantites	Applying
C415.4	knowing about various kinds of digital volt meters	Remembering
C415.5	details knowing about oscilloscope and its applications	Understanding
C415.6	study various types of signal analyzers	Understanding
	COURSE NAME: ELECTRIC POWER QUALITY (C416)	
C416.1	Explain different types of power quality phenomena.	Understanding
C416.2	Analyze the harmonic sources, passive filters, active filters and standards	Creating
C416.3	Explain the principle of voltage regulation and power factor improvement methods	Understanding
C416.4	Analyze the harmonic sources, passive filters, active filters and standards	Analyzing
C416.5	Explain about the relationship between distributed generation and power quality.	Understanding
C416.6	Explain about power quality monitoring method, equipments and analyze the measured data	Analyzing
	COURSE NAME: ELECTRICAL SIMULATION LAB(C417)	
C417.1	To simulate integrator circuit, differentiator circuit, Boost converter, Buck converter, full convertor and PWM inverter.	Applying
C417.2	To simulate transmission line by incorporating line, load and transformer models.	Evaluting
C417.3	To perform transient analysis of RLC circuit and single machine connected to infinite bus(SMIB).	Evaluting
	COURSE NAME: POWER SYSTEMS & SIMULATION LAB(C418)	
C418.1	Apply software packages like MATLAB/Simulink and PSCAD for power systems	Applying
C418.2	Determine positive, negative and zero sequence systems and fault analysis	Understanding
C418.3	Determine the dielectric strength of transformer oil using HV testing kit and calibrate the Tong t	Applying
C418.4	Determine power flow solutions by using different methods.	Applying
C418.5	Analyze the performance of transmission lines.	Analyzing
C418.6	Analyze the different power system components under fault condition.	Analyzing
	IV YEAR II SEMESTER	
	COURSE NAME: DIGITAL CONTROL SYSTEMS (C421)	
C421.1	Explain digital control systems and their applications.	Understanding
C421.2	Analyze digital control systems in the z-domain and its properties.	Applying
C421.3	Explain the basic principles and modeling of digital control system in transfer function and state-space domain	Understanding
C421.4	Solve analysis techniques like Jury stability criteria and Routh stability criteria	Applying
C421.5	Explain the design procedure for controller for digital control system using root locus method, Bilinear transformation	Understanding
C421.6	Elaborate the fundamentals and design procedures of deadbeat controllers for digital control	Creating
	COURSE NAME: HVDC TRANSMISSION (C422)	
C422.1	Understand the t of HVDC transmission systems.	Creating
C422.2	Analyze the HVDC Converters .	Understanding
C422.3	Understand the control of HVDC system and power control.	Understanding
C422.4	understand the Reactive Power control in HVDC.	Understanding
C422.5	Analyze the power flow in AC/DC systems.	Understanding
C422.6	Analyze the different faults and what typeof protection is needed.	Understanding
	COURSE NAME: ELECTRICAL DISTRIBUTION SYSTEMS (C423)	
C423.1	Differentiate the types of loads and their characteristics.	Understanding
C423.2	Analyse radial and loop type distribution feeders.	Creating

C423.3	Determine the voltage drop and power loss in a distribution system.	Applying
C423.4	Develop protection system and its co-ordination in distribution system.	Creating
C423.5	Analyse the best methods for power factor improvement and voltage control.	Applying
C423.6	Understand the effect of capacitance in voltage control of distribution system.	Analysing

COURSE NAME: HIGH VOLTAGE ENGINEERING (C424)

C424.1	Understand the Performance of High Voltages with regard to different configuration of electrode systems	Understanding
C424.2	Illustrate the theory of breakdown and withstand phenomena of all types of dielectric materials.	Remembering
C424.3	Employ the techniques of generation of AC,DC and Impulse Voltages	Understanding
C424.4	Apply Knowledge for measurement of High Voltage and High Current AC,DC and impulse	Applying
C424.5	Measure dielectric property of material used for HV equipment	Evaluating
C424.6	Test various equipments used in HV engineering	Analyzing

COURSE NAME: SEMINAR (C425)

C425.1	Student can able to identify and solve the issues related to electrical engineering by using engineering concepts	Applying
C425.2	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources	Evaluating
C425.3	Student can apply and simulate the result by using different softwares or possible extend that result as a prototype	Applying
C425.4	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.	Applying
C425.5	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.	Evaluating

COURSE NAME: PROJECT (C426)

C426.1.	Student can able to identify and solve the issues related to electrical engineering by using engineering concepts.	Applying
C426.2.	Student should do the literature survey and recall the basics of the subjects in the area from recent journals and other sources.	Evaluating
C426.3.	Student can apply and simulate the result by using different softwares or possible extend that result as a prototype.	Applying
C426.4.	Students able to use conventional and latest technologies and apply the knowledge acquired and solve the problems in their project work.	Applying
C426.5.	Compare the result of their work to improve the quality of work.	Evaluating
C426.6.	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

HOD

HEAD OF THE DEPARTMENT
ELECTRICAL & ELECTRONICS ENGG.,
B.V.C. INSTT. OF TECH. & SCIENCE
AMALAPURAM-533 221 , E.G.DI., A.P.

INSTITUTE OF TECHNOLOGY & SCIENCE * BVC * AMALAPURAM

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PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLGY & SCIENCE
(Approved by AICTE, Permanently Affiliated to JNTUK, Kakinada, Accredited by NAAC with 'A' Grade)
Batlapalem, Amalapuram, Indupalli Post, Dr. B. R. A. Konaseema Dist. AP, INDIA – 533201.
Phone No: 08856 – 235416, e – Mail: bvts@bvcgroup.in , Website: www.bvcits.edu.in
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES

BATCH 2018-22

FIRST YEAR FIRST SEMESTER (I – I)		
ENGLISH- I (C111)		
CO #	**COURSE OUTCOME**	**BTL**
C111.1	Classify and compare different resources to serve the needs of the society in different ways.	Understand
C111.2	Apply road safety measures in day to day life in different modes of transport and Write paragraphs effectively.	Apply
C111.3	Apply science and technology in inventing latest engineering tools to discern their advantages and disadvantages.	Apply
C111.4	Choose viable and alternative sources of energy to tide over the crisis of depleting sources.	Evaluate
C111.5	Grasp the significance of bio-diversity and ecological balance like preservation of Flora and Fauna and enhance skills in writing.	Understand
C111.6	Identify safety measures against hazards at home, labs, industry and work places as well and familiarize themselves with office etiquette, ethics and enhance skills in writing.	Analyze
Mathematics – I (C112)		
C112.1	Solve the first order differential equations and able to Apply physical problems.	Apply
C112.2	Solve higher order linear differential equations with constant coefficients.	Apply
C112.3	Find the Laplace transform of functions and evaluation of integrals and inverse Laplace transform of different functions and solve the differential equations using Laplace transform.	Evaluate
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	: Find the partial derivative by elimination of arbitrary function and arbitrary constant. Solve the linear and non-linear PDE's.	Analyze
C112.6	Solve the partial differential equations using homogenous and non-homogenous.	Apply
Mathematics - II (C113)		
C113.1	Solve the algebraic and transcendental equations by different methods.	Apply
C113.2	Solve the different interpolation formulae to find a polynomial or the value of the polynomial at a given point.	Apply
C113.3	Find the Quadrature, the solutions of ordinary differential equations by different formulae.	Evaluate
C113.4	Interpret a function as a Fourier series Dirichlet's conditions.	Apply
C113.5	Solve the problems on Fourier transforms using real and complex functions.	Apply

C113.6	Demonstrate capacity to mode physical phenomena using PDE's and to Apply problem solving using concepts and techniques from PDE and Fourier analysis applied to diverse situation in physics, engineering mathematics.	Apply
	Applied Physics (C114)	
C114.1	Explain the physical significance of optics and hence estimate the speed of light, wave length, refractive index by using interference	Understand
C114.2	Explain the resolving power of various optical instruments like grating, telescope and micro scope	Understand
C114.3	Explain about polarized light and optical activity using polarization and describe the construction and working of various lasers	Understand
C114.4	Develop various engineering applications involving electromagnetic fields	Analyze
C114.5	Apply the knowledge of basic quantum mechanics and summarize the importance of free electrons in determine the properties of metals	Apply
C114.6	Classify materials as metals, insulators, semiconductors and explain the properties of semiconductors with application to the hall effect	Analyze
	Computer Programming (C115)	
C115.1	Demonstrate the basic components and software's used in computer programming language	Understand
C115.2	Develop and compile and debug programs in C language and Demonstrate syntaxes, predefine functions & operators in computer programming language.	Apply
C115.3	Build the c programs involving decision making statements, looping statements and understand the control flow of the program.	Create
C115.4	Choose Functions and Recursion concepts to solve the complex c programs.	Evaluate
C115.5	Discuss arrays, strings and develop c programs using string manipulation functions.	Create
C115.6	Analyze different file handling functions and dynamic memory management functions.	Analyze
	Engineering Drawing (C116)	
C116.1	Classify the basic concepts, methodologies of engineering drawing, visualize and construct curved profiles in developing new products like gears and other engineering applications.	Understand
C116.2	Construct various types of scales for engineering application like maps, buildings, bridges	Apply
C116.3	Analyze the concept of projections involving points and lines.	Analyze
C116.4	Analyze the theory of projection in planes and Apply in manufacturing processes.	Analyze
C116.5	Analyze the concept of projection of solids inclined to both the planes	Analyze
C116.6	Develop the orthographic projections and imagine the components by isometric projection by representing three dimensional objects in 2D in technical and engineering drawings.	Apply
	English - Communication Skills Lab I (C117)	
C117.1	Classify why study spoken English among the students to become successful in the competitive world.	Understand
C117.2	Analyze the students to make request asking for, giving and refusing permissions, asking for and giving directions in live situations.	Analyze
C117.3	Explain the students in classifying, inviting, complaining, congratulating, apologizing, advising, suggesting, agreeing and disagreeing and expressing sympathy.	Understand
C117.4	Evaluate the students about the English phonetics knowledge and the lack of one to one correspondence between the alphabet and the sounds of English,	Evaluate
C117.5	Analyze the students to know about consonant clusters in English in order to improve their pronunciation.	Analyze

C117.6	Identify the students about the principles of silent letters and pronunciation of inflections in English and enable the students to learn the important features of spoken language like stress and intonation.	Apply
Applied / Engineering Physics Lab (C118)		
C118.1	Explain the physical significance of optics and hence estimate the speed of light, wavelength, refractive index, etc. using interference.	Understand
C118.2	Explain the Resolving power of various optical instruments like grating, telescope & microscope.	Understand
C118.3	Explain the about polarized light and optical activity using polarization and describe the construction and working of various lasers.	Understand
C118.4	Analyze the certain physical quantities of a certain wire, tuning fork and compound pendulum	Analyze
C118.5	Apply the knowledge of basic quantum mechanics and summarize the importance of free electrons in determining the properties of Metals.	Apply
C118.6	Classify materials as metals, insulators, or semiconductors, and Explain the quantified properties of semiconductors with application to the Hall effect.	Analyze
Applied / Engineering Physics –Virtual Labs – Assignments (C119)		
C119.1	Explain the slit width, wavelength using LASER	Understand
C119.2	Explain the Numerical Aperture by using optical fiber.	Understand
C119.3	Verify the photo electric effect.	Understand
C119.4	Verify the laws of Damped oscillations and simple pendulum	Understand
C119.5	Determining the value by using B-H curve and Hysteresis	Understand
C119.6	Determining the value by using Hall effect.	Understand
Engineering Workshop & IT Workshop(C1110)		
C1110.1	Understand the basic components and peripherals of a computer	Understand
C1110.2	Demonstrate to become familiar in configuring a system.	Create
C1110.3	Analyze the usage of productivity tools.	Create
C1110.4	Evaluate the acquire knowledge about the netiquette and cyber hygiene.	Evaluate
C1110.5	Apply the effective decentralization and sustainable management at different level.	Apply
C1110.6	Create the concepts of patterns decentralization implementation	Create
FIRST YEAR SECOND SEMESTER (I – II)		
ENGLISH-II (C121)		
C121.1	Learn that the very purpose of education is to enhance knowledge and wisdom.	Understand
C121.2	Develop global harmony and peaceful co-existence among people and society.	Apply
C121.3	Discover different cultures due to globalization and manage different cultural shocks.	Analyze
C121.4	Examine outdated traditions in society with the application of wisdom.	Understand
C121.5	Learn to protect environment for peaceful existence of future generations and learn report writing for media.	Understand
C121.6	Get influenced by eminent personalities and build luminous future successfully with their inherent passion, interest and burning desire in their areas of interests.	Remember
Mathematics – III (C122)		
C122.1	Find Rank and Solve the linear system of equations by using different methods.	Apply
C122.2	Find the eigen values and eigen vectors and also finding 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.	Remember
C122.3	Tracing the curve for the given equation, evaluate the double and triple integrals by direct methods, change of order of integration and change of variables.	Analyze
C122.4	Evaluate the given integrals by using Beta and Gamma functions.	Evaluate

C122.5	Find the gradient of a scalar field, divergence and curl of vector field and vector identities.	Remember
C122.6	Evaluate the line, surface and volume integrals. Solve the problems using Vector integral theorems.	Evaluate
	Applied Chemistry (C123)	
C123.1	Analyze the concept of improvement of impact strength of plastic materials	Analyze
C123.2	Make use of electrochemical series while preparing different cells.	Apply
C123.3	Analyze and interprets the formation of different nano materials	Analyze
C123.4	Explain different forms of energy in atoms and molecules change upon interacting with electromagnetic radiation	Understand
C123.5	Utilizes the non- conventional energy resources purposefully	Apply
C123.6	obtain the knowledge of computational chemistry and molecular machines	Remember
	Electrical and Mechanical Technology (C124)	
C124.1	Explain the constructional details and principle of operation of dc machines and Acquire knowledge about the constructional details, principle of operation of transformers.	Understand
C124.2	Recall the constructional details and principle of operation of alternators and induction motors.	Remember
C124.3	Build various instruments and equipment's used for the measurement of various electrical engineering parameters.	Apply
C124.4	Classify the energy forms & its conversions, working of I.C. Engines & its performance parameters.	Understand
C124.5	Analyze the modes of Heat transfer for simple geometries.	Analyze
C124.6	Explain the Power transmission by drives and different manufacturing methods.	Understand
	Environmental Studies (C125)	
C125.1	Explain the eco system and its function in the Environment	Understand
C125.2	Aware the importance of natural resources and it's conservation	Understand
C125.3	Analyzes the diversity of life on Earth and its importance	Analyze
C125.4	Execute different programs in ecofriendly way	Apply
C125.5	Describe the different laws to protect our Environment	Analyze
C125.6	Conduct research in safe and Responsible manners communicating the Environmental subjects more effectively	Apply
	Data Structures (C126)	
C126.1	Obtained knowledge on understanding of the concepts that underlie linear and non-linear data structures.	Understand
C126.2	Be familiar in define mechanisms and analyze different operations like creation, insertion, deletion, traversing mechanism etc. on various data structures.	Analyze
C126.3	Obtained knowledge on understand and evaluate the given problem by choosing appropriate data structure.	Evalate
C126.4	Be familiar in learn about different trees like binary, threaded binary, heap etc.	Create
C126.5	Be analyzing different paths algorithms related to the issue of how to find a shortest path with minimum cost.	Analyze
C126.6	Obtained knowledge on to create different sorting techniques in data structures.	Apply
	Applied / Engineering Chemistry Lab (C127)	
C127.1	Develop better understanding of titration	Understand
C127.2	Explain the difference between solubility and dissociation in water and Apply this knowledge to acids and bases	Understand
C127.3	Estimate the hardness of water in terms of calcium and magnesium ions	Evaluate
C127.4	Apply safety rules in practice of laboratory investigations	Apply

C127.5	Analyze the strength of acids and bases by using conductometric titration	Analyze
C127.6	Explain the different instrumental methods of chemical analysis	Analyze
English Communications Skills Lab II (C128)		
C128.1	Classify the students to participate in Debate as a competitive event.	Understand
C128.2	Analyze the students actively participate in group discussions following all the rules and using proper expressions.	Analyze
C128.3	Explain the students to impart various skills in making various types of presentations.	Understand
C128.4	Evaluate the students for an interview, the final stage in the selection process.	Evaluate
C128.5	Analyze the students with email writing, techniques and etiquette, to guide the students to write CV to suit different contexts.	Analyze
Computer Programming Lab (C129)		
C129.1	Explain C programming development environment, compiling, debugging, and linking and executing a program using the development environment	Understand
C129.2	Develop real time applications using the power of C language features	create
C129.3	Apply the in-built functions and customized functions for solving the problems.	Apply
C129.4	Analyze logical thinking, Implement the algorithms and analyze their complexity, Identify the correct and efficient ways of solving problems	Analyze
C129.5	Create complexity of problems, modularize the problems into small modules and then convert them into programs	create
C129.6	Evaluate the Arrays, Strings, pointers, memory allocation techniques and use of files for dealing with variety of problems.	Evaluate
SECOND YEAR FIRST SEMESTER (II – I)		
Electronics Devices and Circuits (C211)		
C211.1	Explain the Semiconductor physics concepts	Understand
C211.2	Summarize the formation of junctions in PN junction diode and characteristics of various special diodes	Understand
C211.3	Understand the working principal of rectifiers with and without filters	Understand
C211.4	Understand the principal of operation and characteristics of bipolar junction transistors and FET	Understand
C211.5	Demonstrate the need of biasing and also examine various biasing concepts	Apply
C211.6	Analysis the performance of small signal low frequency transistor amplifier models of BJT and FET	Analyze
Switching Theory and Logic Design (C212)		
C212.1	Explain about number systems, compliments form, 4-bit codes and conversion from one radix to another, Illustrate on logic gates, universal gates and error detection & correction codes.	Understand
C212.2	Explain about various theorems and postulates of Boolean algebra, solve logic functions using Boolean theorems and k-maps up to 6 variables	Apply
C212.3	Construct various combinational logic circuits like adders & multiplexers etc., Build Boolean functions using decoders and multiplexers	Apply
C212.4	Illustrate the PLD's and Develop Boolean functions by using PLA, PAL and PROM	Apply
C212.5	Construct various sequential logic circuits like flip-flops & counters etc., conversion from one Flip-flop to another,	Apply
C212.6	Explain about finite state machine and Analyze the clocked sequential circuits using state diagrams, state tables and Melay to Moore conversion.	Analyze
Signals and Systems (C213)		
C213.1	Describe the concepts of various signals and systems and Orthogonal functions.	Understand
C213.2	Analyze the spectral characteristics of signals using Fourier analysis.	Analyze
C213.3	Apply sampling theorem to convert continuous time signals to discrete time signals.	Apply

C213.4	Analyze the convolutions and co-relations of LTI and LTV with relative functions.	Analyze
C213.5	Analyze the behavior of unstable systems using Laplace transforms.	Analyze
C213.6	Apply z transform for Discrete time signals and systems.	Apply
	Network Analysis (C214)	
C214.1	Make use of various laws and techniques to solve basic DC RLC circuits.	Apply
C214.2	Utilize Mesh and Node analysis and solve AC RLC circuits	Apply
C214.3	Experiment with the behavior of steady states and transient states in RLC circuits	Apply
C214.4	Identify the suitable theorem for solving various circuits	Apply
C214.5	Experiment with the two port network parameters	Apply
C214.6	Develop the filter design concepts in real world applications	Apply
	Random Variables and Stochastic Process (C215)	
C215.1	Demonstrate the random variables and Define and manipulate distribution and density functions	Apply
C215.2	Apply various operations like expectations, variances, etc. from probability density functions and probability distribution functions	Apply
C215.3	Compare probability models and function of random variables based on single & multiples random variables.	Analyze
C215.4	Explain the concept of random process, differentiate between stochastic and ergodic processes.	Understand
C215.5	Illustrate the concept of random processes and determine covariance and spectral density of stationary random processes.	Apply
C215.6	Apply the principles of a random process in system concepts.	Apply
	Managerial Economics and Financial Analysis (C216)	
C216.1	Explain the fundamental concepts of managerial economics	Understand
C216.2	Analyze various cost concepts.	Analyze
C216.3	Classify various pricing strategies and market structures	Understand
C216.4	Identify various forms of business organization.	Apply
C216.5	Analyze fundamental concepts of accounting and financial statements.	analyze
C216.6	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
	Networks and Electrical Technology Lab (C218)	
C218.1	Analyze RLC circuits and understand resonant frequency and Q-factor.	Analyze
C218.2	Apply network theorems to analyze the electrical network.	Apply
C218.3	Explain the performance of dc shunt machine.	Understand
C218.4	Analyze the performance of 1-phase transformer. .	Analyze
C218.5	Determine regulation of alternators through synchronous impedance method.	Evaluate
	SECOND YEAR SECOND SEMESTER (II – II)	
	Electronic Circuit Analysis (C221)	
C221.1	Develop and Explain about small signal high frequency transistor amplifiers using BJT & FET with the help of Hybrid π model.	Apply
C221.2	Develop various multistage amplifiers using BJT & FET and Analyze them.	Analyze

C221.3	Explain various types of feedback amplifiers and their topologies and Analyze the performance of feedback amplifiers.	Analyze
C221.4	Explain the principle and condition for oscillators, analyze various types of oscillators using BJT & FET.	Analyze
C221.5	Classify power amplifiers and Analyze various power amplifiers	Analyze
C221.6	Explain about Q-factor and analyze the bandwidth of different types of tuned amplifiers	Analyze
	Control Systems (C222)	
C222.1	Solve the transfer function of physical systems using block diagram algebra and signal flow graphs.	Apply
C222.2	Analyze the time response specifications of second order systems and to estimate error constants.	Analyze
C222.3	Analyze absolute stability and relative stability of LTI systems using Routh 's stability criterion and root locus method.	Analyze
C222.4	Analyze stability of LTI systems using frequency response methods.	Analyze
C222.5	Analyze Lag, Lead, Lag-Lead compensators to improve systems performance using Bode diagram.	Analyze
C222.6	Model the physical systems as state models and to determine their system response to judge systems controllability and observability.	Apply
	Electromagnetic Waves and Transmission Lines (C223)	
C223.1	Summarize coordinate systems and vector algebra and Define coulombs law and Gauss law for the electrostatic fields	Understand
C223.2	Explain magneto static fields and important deductions made from Maxwell's equations.	Understand
C223.3	Analyze A uniform plane equation and EM wave characteristics in different propagating mediums	Analyze
C223.4	Analyze and solve the problems of EM wave propagation in both perfect conductor and perfect dielectrics for normal and oblique incidences and compute Brewster angle and critical angle	Analyze
C223.5	Choose transmission lines with equivalent circuit and compute the input impedance of transmission lines	Apply
C223.6	Solve the reflection coefficient, VSWR by using smith chart for UHF transmission lines	Apply
	Analog Communications (C224)	
C224.1	Illustrate the concepts of basic communication system, types of analog modulation, Amplitude modulation and demodulation techniques	Understand
C224.2	Explain the types of Amplitude modulation and demodulation and Apply the concept in the time and frequency domain techniques	Apply
C224.3	Apply the concepts of Angle modulation and demodulation techniques in the time and frequency domain techniques	Apply
C224.4	Summarize the concepts of different types of Radio transmitter and receivers.	Understand
C224.5	Identify the SNR and Figure of merit for different analog modulation techniques	Apply
C224.6	Compare the concepts of Pulse Analog modulation and demodulation techniques and Time division multiplexing technique.	Understand
	Pulse and Digital Circuits (C225)	
C225.1	Analyze and Develop linear wave shaping circuits for various input signals.	Analyze
C225.2	Construct the nonlinear wave shaping circuits for generating desired wave shapes using diodes and transistors.	Apply
C225.3	Apply the fundamental concepts of wave shaping for various switching & signal generation circuits.	Apply

C225.4	Analyze and Develop the different multivibrators to generate various non sinusoidal signals for various electronic applications.	Analyze
C225.5	Know the methods of generating voltage sweep wave forms and construct the time base generators.	Apply
C225.6	Realize the logic gates using diodes and transistors, distinguish between logic gates and sampling gates & Apply the operating principles of sampling gates for their applications.	Analyze
	Management Science (C226)	
C226.1	Explain the management functions and decision-making process	Understand
C226.2	Analyze the materials management and inventory management techniques	Analyze
C226.3	Explain the concepts of functional management and marketing management	Understand
C226.4	Solve the concepts of project management problems	Apply
C226.5	Interpret the concepts of strategic management	Understand
C226.6	Elaborate the contemporary Management Practices	Create
	Electronic Circuit Analysis Lab (C227)	
C227.1	Find 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 response using hardware and software	Analyze
C227.3	Examine and draw the response of oscillator circuits using hardware equipment and MULTISIM software	Analyze
C227.4	Assess the coupled amplifier circuits using hardware equipment and software.	Evaluate
C227.5	Determine the characteristics of power amplifier circuit using software and hardware.	Evaluate
	Analog Communications Lab (C228)	
C228.1	Demonstrate about Spectrum Analyzer, MATLAB Simulink and 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 to find the Modulation Index.	Apply
C228.4	Construct the Sampling theorem and to Apply in Time & Frequency Domain of Pulse modulation and Demodulation techniques.	Apply
C228.5	Experiment with Pre-emphasis & De-emphasis to understand the FM concept.	Apply
C228.6	Identify the characteristics of Radio Receiver, AGC and PLL.	Apply
	THIRD YEAR FIRST SEMESTER (III – I)	
	Computer Architecture and Organization (C311)	
C311.1	Understand the architecture of modern computer.	Understand
C311.2	Apply the machine level instructions and design the program.	Apply
C311.3	Analyze the effective address of an operand by addressing modes.	Analyze
C311.4	Apply the organization of I/O and memory devices.	Apply
C311.5	Understand various memory systems to store the data.	Understand
C311.6	Develop micro programs using micro instructions.	Creating
	Linear IC Applications (C312)	
C312.1	Summarize types of Differential Amplifier configurations and Level translator to Apply for the design of Op-Amp.	Apply
C312.2	Understand the particulars of Op-Amp with its DC and AC characteristics	Understand
C312.3	Develop circuits using Op-Amp for various Linear & Non-Linear applications	Apply
C312.4	Design and Analysis of types of filters both 1st order and 2nd order	Analyze
C312.5	Understand the functional blocks & Explain the applications of IC's 555 Timer,565 PLL and 566 VCO	Understand

C312.6	Analyze various types of DAC and ADC techniques and characteristics.	Analyze
	Digital IC Applications (C313)	
C313.1	Understand various Digital Logic Families and their Interfacing	Understand
C313.2	Discuss the basics of VHDL and programming models	Understand
C313.3	Illustrate and implement digital systems using VHDL	Apply
C313.4	Design combinational circuits using VHDL code and relevant ICs	Apply
C313.5	Design and implement sequential circuits using VHDL code and relevant ICs	Apply
C313.6	Design and Implement Synchronous and Asynchronous Logic Circuits	Apply
	Digital Communications (C314)	
C314.1	Understand basic pulse digital modulation schemes of Digital Communication Systems.	Understand
C314.2	Discuss various Digital Modulation techniques.	Understand
C314.3	Analyze the error performance of Digital Modulation Techniques	Analyze
C314.4	Apply information theory and source coding techniques to increase coding efficiency.	Apply
C314.5	Analyze various source coding techniques and capacity of analog, digital and Gaussian channel	Analyze
C314.6	Identify error detection and error correction capabilities of linear block and convolution codes.	Apply
	Antenna and Wave Propagation (C315)	
C315.1	Apply principles of electromagnetic to explain antenna radiation. Explain various Antenna parameters	Apply
C315.2	Explain dipole antenna, Establish mathematical equations for various parameters of thin linear antenna.	Understand
C315.3	Analyze Broadside array and End fire Array Yagi-uda array.	Analyze
C315.4	Analyze long wire antenna, Micro strip Antennas, and helical antenna.	Analyze
C315.5	Explain VHF and UHF microwave antenna and Analyze antenna measurements to asses antenna performance.	Understand
C315.6	Identify the characteristics, Atmospheric and terrestrial effects on radio propagation.	Apply
	Pulse and Digital Circuits Lab (C316)	
C316.1	Analyze and Develop the pulse shaping circuits to process sinusoidal and non-sinusoidal signals.	Analyze
C316.2	Interpret the switching characteristics of a transistor.	Understand
C316.3	Demonstrate the fundamentals of logic gates, flip flops and some applications.	Understand
C316.4	Apply the operating principle of sampling gates to transmit the input signal to output for specified time interval.	Apply
C316.5	Develop and Analyze the different multivibrators to generate various non sinusoidal signals for required applications.	Analyze
C316.6	Experiment with UJT Relaxation oscillator and Bootstrap sweep circuit to generate sweep waveforms.	Apply
	Linear IC Applications Lab (C317)	
C317.1	Summarize functioning, parameters and Specifications of IC 741, IC 555, IC 565, IC 566, IC 1496.	Understand
C317.2	Analyze and Develop various circuits using IC 741 op-amp for various applications.	Analyze
C317.3	Analyze first order Active filter circuits using IC 741 op-amp Analyze and design amplifiers, active filters and waveform generators.	Create
C317.4	Analyze the various applications of 555 timers.	Analyze
C317.5	Experiment with IC 565 – PLL and IC 566 – VCO to implement PLL and VCO applications	Apply

C317.6	Analyze the fixed voltage regulators of IC 78XX, IC 79XX series and variable voltage regulator of IC 723.	Analyze
	Digital IC Applications Lab (C318)	
C318.1	Develop VHDL/Verilog HDL Source code for combinational and sequential circuits.	Create
C318.2	Simulate combinational and sequential circuits using Xilinx Vivado software simulator.	Create
C318.3	Analyze the obtained simulation results using XST synthesizer.	Analyze
C318.4	Synthesize the logical operations of combinational and sequential circuits on the Xilinx FPGA Hardware.	Create
	Professional Ethics & Human Values (C319)	
C319.1	Define the basic insights and inputs to the student on ethics, values, morals.	Remember
C319.2	Illustrate maintain ethical conduct and discharge their professional duties.	Understand
C319.3	Explain the concepts of engineering ethics.	Understand
C319.4	Analyze engineers' responsibilities towards safety and risk	Analyze
C319.5	Find out the engineers' duties and rights.	Remember
C319.6	Identify various ethical issues at global level.	Apply
	THIRD YEAR SECOND SEMESTER (III – II)	
	Microprocessors and Microcontrollers (C321)	
C321.1	understand the Architecture, Pin diagram, Minimum mode, maximum mode, System timing diagrams and interrupts of 8086 Microprocessor	Understand
C321.2	Design and Develop various assembly language programs by using the addressing modes and the Instruction set.	Apply
C321.3	Develop the memory interfacing problems and interfacing various modules like 8254 Timer, Interrupt controller, DMA, IO devices, ADC/DAC and Stepper motor with 8080 Microprocessor.	Apply
C321.4	Explain the special purpose registers, memory organization and different operating modes of 80386 & 80486.	Understand
C321.5	Illustrate the 8051 architecture, SFRs and various interfacing modules of 8051 Microcontroller and also Develop sample programs using ALP.	Apply
C321.6	Explain the memory, timers, parallel and serial IOs, interrupts & architecture of PIC 16F877.	Understand
	Microwave Engineering (C322)	
C322.1	Understand completely the rectangular waveguides, their mode characteristics	Understand
C322.2	Understand completely circular waveguides, Cavity Resonators, Microstrip lines	Understand
C322.3	Classify various microwave tubes their power generation and amplification and performance characteristics.	Analyze
C322.4	Examine the performance characteristics of HELIX TWTS and M-type Tubes	Understand
C322.5	Compare various properties of Scattering Matrix, and understand the utility of S-parameters in microwave component design	Analyze
C322.6	Examine solid state microwave sources and establish the measurement procedure of various microwave parameters.	Apply
	VLSI Design (C323)	
C323.1	Explain various IC fabrication process and various electrical properties of MOS transistors	Understand
C323.2	summarize the design rules, concepts of stick diagrams, layouts for various MOS technologies and design various logic circuits	Understand
C323.3	Demonstrate basic circuit concepts and determine impact of scaling on MOS circuit	Apply
C323.4	Examine the I/O circuits in VLSI design for reliability and methods of fault detection techniques	Apply

C323.5	Explain the concept of FPGA design process and FPGA families for implementing different logic circuits, able to define synthesis process	Understand
C323.6	Summarize different methods and techniques for low power VLSI design	Understand
	Digital Signal Processing (C324)	
C324.1	Explain the Discrete Time Signals and Systems	Understand
C324.2	Explain the importance of FFT algorithm for computation of Discrete Fourier Transform	Understand
C324.3	Classify of various implementations of digital filter structures	Analyze
C324.4	Examine the function of FIR and IIR Filter design procedures	Analyze
C324.5	Explain the Multirate Processing	Understand
C324.6	Examine the concepts of DSP Processors	Analyze
	OOPS through Java (C325)	
C325.1	Illustrate Java based software code of medium-to-high complexity.	Understand
C325.2	Define basic concepts of java programming language.	Remember
C325.3	Demonstrate the basic approaches to design software applications by using an integrated development environment to develop object-oriented java programs.	Understand
C325.4	Read and make elementary modifications to Java programs that solve real world problems.	Apply
C325.5	Design applications of Java Applets & Event handling.	Create
C325.6	Explain the basic principles of creating java applications with Graphical user interface.	Understand
	Microprocessors and Microcontrollers Lab (C326)	
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	Apply
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
	VLSI Design Lab (C327)	
C327.1	Develop the schematic and layout of inverter, universal gates and analyze the output characteristics using EDA tool.	Analyze
C327.2	Build the schematic and layout of combinational circuits and verify its output using EDA tool.	Apply
C327.3	Examine the characteristics of schematic and layout of sequential circuits using EDA tool.	Analyze
C327.4	Construct Static RAM cell and 8-bit DAC using R-2R latter network and analyze the output using EDA tool.	Apply
	Digital Communications Lab (C328)	
C328.1	Develop multiplexing and demultiplexing technique.	Apply
C328.2	Develop analogue to digital converters like PCM, DM.	Apply
C328.3	Demonstrate digital modulation and demodulation techniques.	Understand
C328.4	Analyze the performance of Companding technique and its performance.	Analyze
C328.5	Make use of Encoding and Decoding process of block codes, convolution codes.	Apply
	COURSE NAME: IPR & Patents(C329)	
C329.1	Interpret the Concept of IPR Importance and mechanisms.	Understand
C329.2	Evaluate the copyrights and copyright registration.	Evaluate
C329.3	Identify the patents and Patent Cooperation Treaty.	Apply

C329.4	Formulate Trademarks and Likelihood of Confusion - Dilution of Ownership.	Create
C329.5	Identify the concepts of trade secrets Trade Secret Litigation.	Apply
C329.6	Formulating the cyber laws and cybercrimes.	Create
FOURTH YEAR FIRST SEMESTER (IV – I)		
Radar Systems (C411)		
C411.1	Explain the basic principle of radar and radar range Equation.	Understand
C411.2	Classify the types of radars	Understand
C411.3	Compare the different radar systems.	Analyze
C411.4	Compare different Tracking Techniques of Radar.	Analyze
C411.5	Apply the Characteristics of a Matched filter to reduce the noise.	Apply
C411.6	Illustrate the basic concepts of radar receiver.	Understand
Digital Image Processing (C412)		
C412.1	Apply the Different Transforms Techniques & Their Use in Image Processing Applications.	Apply
C412.2	Demonstrate Spatial & Frequency Domain Filtering (Like Smoothing & Sharpening Operations) of Images.	Understand
C412.3	Apply Restoration Operations/Techniques on Images.	Apply
C412.4	Apply Different Color Image Processing Techniques on Images.	Apply
C412.5	Explain the Image Compression Techniques and Multi-Resolution Processing of Images.	Understand
C412.6	Explain Morphological Operations of Images & Image Segmentation.	Apply
Computer Networks (C413)		
C413.1	Discuss Basic terminology of the computer networking and enumerate the layers of OSI model and TCP/IP model	Understand
C413.2	Understand the properties of Physical Layer and Different Multiplexing Techniques	Understand
C413.3	Analyze data communication link considering elementary concepts of data link layer protocols for error detection and correction.	Analyze
C413.4	Analyze Medium Access Control Sub layer and performance of LAN protocols	Analyze
C413.5	predict Network Layer concepts, design issues, protocols and congestion	Apply
C413.6	Explain application layer protocols and internet applications such as network security, Email and DNS.	Understand
Optical Communications (C414)		
C414.1	Explain the overview of the optical fiber communication and show the functionality of components in a fiber optic communication system	Understand
C414.2	Summarize various optical fiber materials interpret numerous types of losses in different fibers during optical signal transmission	Understand
C414.3	Explain various optical fiber connectors, joints and losses associated with them	Understand
C414.4	Compare characteristics of fiber sources and detectors & interpret various optical receivers and their performance measures	Analyze
C414.5	Summarize the basics of power launching and coupling from optical sources to fiber and interpret various optical receivers and their performance measures	Understand
C414.6	Analyze the digital optical link, Wavelength division multiplexing	Analyze
Electronic Switching Systems (C415)		
C415.1	Explain the need for switching systems and their evolution from analog to digital	Understand
C415.2	Explain and discuss the public switched telephone network	Understand
C415.3	Define private networks and integrated networks	Analyze
C415.4	Classify and compare the different types of networks	Apply
C415.5	Illustrate the cellular telephone system	Apply
C415.6	Examine the integrated services digital network and voice data integration	Analyze

Embedded Systems (C416)		
C416.1	Understand the basic concepts of an embedded system and know the characteristics of an embedded system	Understand
C416.2	Explain the components required for an embedded system	Understand
C416.3	Analyze various embedded firmware design approaches on embedded environment.	Analyze
C416.4	Discuss the operating system basics and its components, list operating systems and know hardware software co-design	Understand
C416.5	Describe the embedded system development and its tools	Understand
C416.6	Classify various implementation tools and learn the testing process	Analyze
Micro Wave Engineering & Optical Lab (C417)		
C417.1	Determine characteristics of various microwave devices	Apply
C417.2	Determine various parameters of various waveguide components	Apply
C417.3	Experiment on antenna design using simulator	Analyze
C417.4	Demonstrate characteristics of various light sources	Apply
C417.5	Determine various measurements for optical links	Apply
Digital Signal Processing Lab(C418)		
C418.1	Analyze Linear and Circular Convolutions domain and frequency domain in time	Analyze
C418.2	Build the Waveform Generation related to Sine wave	Apply
C418.3	Construct of Butterworth Filter and Chebyshev Filter using IIR filters for band pass, band stop, low pass and high pass filters	Apply
C418.4	Develop windows – Rectangular, Hamming window	Apply
FOURTH YEAR SECOND SEMESTER (IV – II)		
Cellular Mobile Communications(C421)		
C421.1	Identify the limitations of conventional Mobile Telephone Systems; define the basic cellular mobile system.	Apply
C421.2	Explain Co-channel interference. Explain adjacent channel interference, near and far end interference.	Understand
C421.3	Distinguish cell site and mobile antennas.	Analyze
C421.4	Analyze frequency management and mobile antennas.	Analyze
C421.5	Define Handoff, Distinguish types of handoffs.	Remember
C421.6	Compare and contrast different multiple access schemes.	Understand
Electronic Measurements and Instrumentation(C422)		
C422.1	Summarize performance characteristics of instruments and multi-meters for voltage, current and resistance measurements	Understand
C422.2	Identify various signal generators and wave analyzers	Apply
C422.3	Experiment with various types of CROs (analog and digital)	Apply
C422.4	Construct AC bridges	Apply
C422.5	Utilize active and passive transducers	Apply
C422.6	Outline measurement of physical parameters and DAQs	Understand
Satellite Communications (C423)		
C423.1	Summarize the basic concepts, applications, frequencies used and types of satellite communications	Understand
C423.2	. Examine the concept of look angles, launches and launch vehicles and orbital effects in satellite communications	Apply
C423.3	Demonstrate the various satellite subsystems and its functionality.	Apply
C423.4	Analyze the concepts of satellite link design and calculation of C/N ratio	Analyze
C423.5	Demonstrate the concepts of multiple access and various types of multiple access techniques in satellite systems	Apply
C423.6	Understand the concepts of satellite navigation, architecture and applications of GPS.	Understand

Wireless Sensors and Networks (C424)		
C424.1	Summarize the overview of WSN and its architectures.	Understand
C424.2	Explain the Networking technologies and its topologies.	Understand
C424.3	Diagram illustrate the Mac protocols for wireless sensor networks.	Analyze
C424.4	Illustrate routing protocols and its classification based on application.	Apply
C424.5	Discuss the issues in designing the transport layers protocol for Ad-hoc wireless networks.	Understand
C424.6	Outline security in WSN, various sensor network platforms and tools, and applications of WSN	Analyze
Seminar (C425)		
C425.1	Explain motivation for any topic of interest and develop a thought process for technical presentation.	Understand
C425.2	Study research papers for understanding of a new field, in the absence of a textbook, to summarize and review them.	Understand
C425.3	Organize a detailed literature survey	Analyze
C425.4	Analyze and comprehend proof-of-concept and related data.	Analyze
C425.5	Impart skills in preparing detailed report describing the topic.	Apply
C425.6	Communicate effectively by making an oral presentation.	Apply
Project (C426)		
C426.1	Outline detailed study of topic assigned	Understand
C426.2	Organize a literature survey using latest journals in the preferred field of study	Apply
C426.3	Develop a detailed plan for conducting project including teamwork	Apply
C426.4	Build detailed analysis/modeling/simulation/design/problem solving as needed	Apply
C426.5	Develop a final product/process. Organize testing	Apply
C426.6	Identify conclusions and suggest future scope. Show thesis to review panel and explain the work.	Understand

Coordinator

HOD

Head of the Department
Electronics & Communication Engineering
B.V.C. Institute of Technology and Science
Batlapalem, Amalapuram - 533 201

Bonam Venkata Chalamayya Institute of Technology & Science
(Approved by AICTE, Permanently Affiliated to JNTUK, Kakinada, Accredited by NAAC with 'A' Grade)
Batlapalem, Amalapuram, Indupalli Post, E. G. Dist, A.P, India - 533 201
Phone No: 08856 235416, E-Mail : bvts@bvcgroup.in, Website : www.bvcits.edu.in
Department of Computer Science and Engineering

COURSE OUTCOMES: R16 CURRICULUM

CO #	COURSE OUTCOME	BLOOMS TAXONOMY LEVEL
	I YEAR I SEMESTER	
COURSE NAME:ENGLISH-I (C111)		
C111.1	Classify and compare different resources to serve the needs of the society in different ways.	Understand
C111.2	Apply road safety measures in day to day life in different modes of transport and Write paragraphs effectively.	Apply
C111.3	Apply science and technology in inventing latest engineering tools to discern their advantages and disadvantages.	Apply
C111.4	Choose viable and alternative sources of energy to tide over the crisis of depleting sources.	Evaluate
C111.5	Grasp the significance of bio-diversity and ecological balance like preservation of Flora and Fauna and enhance skills in writing.	Understand
C111.6	Identify safety measures against hazards at home, labs, industry and work places as well and familiarize themselves with office etiquette, ethics and enhance skills in writing.	Analyze
COURSE NAME: MATHEMATICS – I (C112)		
C112.1	Solve the first order differential equations and able to Apply physical problems.	Apply
C112.2	Solve higher order linear differential equations with constant coefficients.	Apply
C112.3	Find the Laplace transform of functions and evaluation of integrals and inverse Laplace transform of different functions and solve the differential equations using Laplace transform.	Evaluate
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	: Find the partial derivative by elimination of arbitrary function and arbitrary constant. Solve the linear and non-linear PDE's.	Analyze
C112.6	Solve the partial differential equations using homogenous and non homogenous.	Apply

COURSE NAME:MATHEMATICS - II (C113)		
C113.1	Solve the algebraic and transcendental equations by different methods.	Apply
C113.2	Solve the different interpolation formulae to find a polynomial or the value of the polynomial at a given point.	Apply
C113.3	Find the Quadrature, the solutions of ordinary differential equations by different formulae.	Evaluate
C113.4	Interpret a function as a Fourier series dirichlet's conditions.	Apply
C113.5	Solve the problems on Fourier transforms using real and complex functions.	Apply
C113.6	Demonstrate capacity to mode physical phenomena using PDE's and to Apply problem solving using concepts and techniques from PDE and Fourier analysis applied to diverse situation in physics, engineering mathematics.	Apply
COURSE NAME:APPLIED PHYSICS (C114)		
C114.1	Explain the physical significance of optics and hence estimate the speed of light ,wave length ,refractive index by using interference	Understand
C114.2	Explain the resolving power of various optical instruments like grating, telescope and micro scope	Understand
C114.3	Explain about polarized light and optical actvity using polarization and describe the construction and working of various lasers	Understand
C114.4	Develop various engineering applications involving electromagnetic fields	Analyze
C114.5	Apply the knowledge of basic quantum mechanics and summarize the importance of free electrons in determing the properties of metals	Apply
C114.6	Classify materials as metals, insulators, semiconductors and explain the properties of semiconductors with application to the hall effect	Analyze
COURSE NAME:COMPUTER PROGRAMMING (C115)		
C115.1	Demonstrate the basic components and software's used in computer programming language	Understand
C115.2	Develop and compile and debug programs in C language and Demonstrate syntaxes, predefine functions & operators in computer programming language.	Apply
C115.3	Build the c programs involving decision making statements, looping statements and understand the control flow of the program.	Create
C115.4	Choose Functions and Recursion concepts to solve the complex c programs.	Evalate

C115.5	Discuss arrays, strings and develop c programs using string manipulation functions.	Create
C115.6	Analyze different file handling functions and dynamic memory management functions .	Analyze
COURSE NAME:ENGINEERING DRAWING (C116)		
C116.1	Classify the basic concepts, methodologies of engineering drawing, visualize and construct curved profiles in developing new products like gears and other engineering applications.	Understand
C116.2	Construct various types of scales for engineering application like maps, buildings, bridges	Apply
C116.3	Analyse the concept of projections involving points and lines.	Analyze
C116.4	Analyse the theory of projection in planes and Apply in manufacturing processes.	Analyze
C116.5	Analyse the concept of projection of solids inclined to both the planes	Analyze
C116.6	Develop the orthographic projections and imagine the components by isometric projection by representing three dimensional objects in 2D in technical and engineering drawings.	Apply
COURSE NAME: ENGLISH - COMMUNICATION SKILLS LAB I(C117)		
C117.1	Classify why study spoken English among the students to become successful in the competitive world.	Understand
C117.2	Analyze the students to make request asking for, giving and refusing permissions, asking for and giving directions in live situations..	Analyze
C117.3	Explain the students in classifying, inviting, complaining, congratulating, apologizing, advising, suggesting, agreeing and disagreeing and expressing sympathy.	Understand
C117.4	Evaluate the students about the English phonetics knowledge and the lack of one to one correspondence between the alphabet and the sounds of English,	Evaluate
C117.5	Analyze the students to know about consonant clusters in English in order to improve their pronunciation..	Analyze
C117.6	Identify the students about the principles of silent letters and pronunciation of inflections in English and enable the students to learn the important features of spoken language like stress and intonation.	Apply
COURSE NAME: APPLIED / ENGINEERING PHYSICS LAB(C118)		
C118.1	Explain the physical significance of optics and hence estimate the speed of light, wavelength, refractive index, etc. using interference.	Understand

C118.2	Explain the Resolving power of various optical instruments like grating, telescope & microscope.	Understand
C118.3	Explain the about polarized light and optical activity using polarization and describe the construction and working of various lasers.	Understand
C118.4	Analyze the certain physical quantities of a certain wire, tuning fork and compound pendulum	Analyze
C118.5	Apply the knowledge of basic quantum mechanics and summarize the importance of free electrons in determining the properties of Metals.	Apply
C118.6	Classify materials as metals, insulators, or semiconductors, and Explain the quantified properties of semiconductors with application to the Hall effect.	Analyze
COURSE NAME:APPLIED / ENGINEERING PHYSICS –VIRTUAL LABS - ASSIGNMENTS(C119)		
C119.1	Explain the slit width, wavelength using LASER	Understand
C119.2	Explain the Numerical Aperture by using optical fiber.	Understand
C119.3	Verify the photo electric effect.	Understand
C119.4	Verify the laws of Damped oscillations and simple pendulum	Understand
C119.5	Determining the value by using B-H curve and Hysteresis	Understand
C119.6	Determining the value by using Hall effect.	Understand
COURSE NAME: C PROGRAMMING LAB(C1110)		
C1110.1	Explain C programming development environment, compiling, debugging, and linking and executing a program using the development environment	Understand
C1110.2	Develop real time applications using the power of C language features	create
C1110.3	Apply the in-built functions and customized functions for solving the problems.	Apply
C1110.4	Analyze logical thinking, Implement the algorithms and analyze their complexity, Identify the correct and efficient ways of solving problems	Analyze
C1110.5	Create complexity of problems, modularize the problems into small modules and then convert them into programs	create
C1110.6	Evaluate the Arrays, Strings, pointers, memory allocation techniques and use of files for dealing with variety of problems.	Evaluate
IST YEAR II ND SEMESTER		
COURSE NAME:ENGLISH-II(C121)		
C121.1	Learn that the very purpose of education is to enhance knowledge and wisdom.	Understand
C121.2	Develop global harmony and peaceful co-existence among people and society.	Apply

C121.3	Discover different cultures due to globalization and manage different cultural shocks.	Analyze
C121.4	Examine out-dated traditions in society with the application of wisdom.	Understand
C121.5	Learn to protect environment for peaceful existence of future generations and learn report writing for media.	Understand
C121.6	Get influenced by eminent personalities and build luminous future successfully with their inherent passion, interest and burning desire in their areas of interests.	Remember
COURSE NAME:MATHEMATICS - III(C122)		
C122.1	Find Rank and Solve the linear system of equations by using different methods.	Apply
C122.2	Find the Eigen values and Eigen vectors and also finding 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.	Remember
C122.3	Tracing the curve for the given equation, evaluate the double and triple integrals by direct methods, change of order of integration and change of variables.	Analyze
C122.4	Evaluate the given integrals by using Beta and Gamma functions.	Evaluate
C122.5	Find the gradient of a scalar field, divergence and curl of vector field and vector identities.	Remember
C122.6	Evaluate the line, surface and volume integrals. Solve the problems using Vector integral theorems.	Evaluate
COURSE NAME: APPLIED CHEMISTRY(C123)		
C123.1	Analyze the concept of improvement of impact strength of plastic materials	Analyze
C123.2	Make use of electrochemical series while preparing different cells.	Apply
C123.3	Analyze and interprets the formation of different nano materials	Analyze
C123.4	Explain different forms of energy in atoms and molecules change upon interacting with electromagnetic radiation	Understand
C123.5	Utilizes the non- conventional energy resources purposefully	Apply
C123.6	obtain the knowledge of computational chemistry and molecular machines	Remember
COURSE NAME: OBJECT ORIENTED PROGRAMMING THROUGH C++(124)		
C124.1	Enumerate the key concepts of Object Oriented Programming	Understand
C124.2	Use of Object Oriented Technology to experiment special class operations	Apply

C124.3	Implement the concept of polymorphism through operator overloading that enhances reusability	Apply
C124.4	Analyze binding, polymorphism and virtual functions	Analyze
C124.5	Apply Exception handling techniques for resolving run-time errors and use of templates to provide generic programming	Apply
COURSE NAME: ENVIRONMENTAL STUDIES(C125)		
C125.1	Explain the eco system and it's function in the Environment	Understand
C125.2	Aware the importance of natural resources and it's conservation	Understand
C125.3	Analyzes the diversity of life on Earth and it's importance	Analyze
C125.4	Execute different programs in eco friendly way	Apply
C125.5	Describe the different laws to protect our Environment	Analyze
C125.6	Conduct research in safe and Responsible manners communicating the Environmental subjects more effectively	Apply
COURSE NAME: ENGINEERING MECHANICS(C126)		
C126.1	Explain the constructional details and principle of operation of dc machines and Acquire knowledge about the constructional details, principle of operation of transformers.	Understand
C126.2	Recall the constructional details and principle of operation of alternators and induction motors.	Remember
C126.3	Build various instruments and equipments used for the measurement of various electrical engineering parameters.	Apply
C126.4	Classify the energy forms & its conversions, working of I.C. Engines & its performance parameters.	Understand
C126.5	Analyze the modes of Heat transfer for simple geometries.	Analyze
C126.6	Explain the Power transmission by drives and different manufacturing methods.	Understand
COURSE NAME: APPLIED / ENGINEERING CHEMISTRY LAB(C127)		
C127.1	Develop better understanding of titration	Understand
C127.2	Explain the difference between solubility and dissociation in water and Apply this knowledge to acids and bases	Understand
C127.3	Estimate the hardness of water in terms of calcium and magnesium ions	Evaluate
C127.4	Apply safety rules in practice of laboratory investigations	Apply
C127.5	Analyze the strength of acids and bases by using conductometric titration	Analyze
C127.6	Explain the different instrumental methods of chemical analysis	Analyze

COURSE NAME: ENGLISH COMMUNICATIONS SKILLS LAB II(C128)		
C128.1	Classify the students to participate in Debate as a competitive event.	Understand
C128.2	Analyze the students actively participate in group discussions following all the rules and using proper expressions.	Analyze
C128.3	Explain the students to impart various skills in making various types of presentations.	Understand
C128.4	Evaluate the students for an interview, the final stage in the selection process.	Evaluate
C128.5	Analyze the students with email writing , techniques and etiquette, to guide the students to write CV to suit different contexts.	Analyze
COURSE NAME : OBJECT ORIENTED PROGRAMMING THROUGH C++ LAB(C129)		
C129.1	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
C129.2	Design and implement programs using C++.	Create
C129.3	Illustrate how to apply reusability in object oriented programming though C++.	Understand
C129.4	Utilize basic data structures such as arrays and linked list and Utilize various searching and sorting algorithms.	Apply
C129.5	Programs to demonstrate fundamental algorithmic problems including Tree Traversals, Graph traversals, and shortest paths.	Understand
II YEAR I SEMESTER		
COURSE NAME: STATISTICS AND R PROGRAMMING (C211)		
C211.1	Describe the introductory concepts and programming skills in the R Environment in simple and lucid manner.	Understand
C211.2	Analyze with various Operators like Arithmetic, Relational, Logical and Assignment Operators and also with the mechanism behind the usage of Matrices, Functions and Strings in R Environment.	Analyze
C211.3	Apply the various methods to access I/O in R Environment and also about Math functions, Calculus and Sorting, Set operations.	Apply
C211.4	Describe Graphical User Interface to Plot different Charts and Graphics and also color them with different coloring schemes available in R Environment.	Understand

C211.5	Apply the functions relating to various Probability Distributions and Statistical Measures	Apply
C211.6	Describe Machine Learning Models, Survival Analysis	Understand
COURSE NAME: MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE (C212)		
C212.1	Understand the skills in various solving mathematical problems	Understand
C212.2	Apply mathematical principles and logic.	Apply
C212.3	Analyze knowledge of mathematical modeling and proficiency in using algebraic system.	Analyze
C212.4	Solve mathematical calculations using techniques such as permutations and combinations.	Create
C212.5	Communicate effectively mathematical ideas/results verbally or in writing.	Evaluate
C212.6	Create the data numerically and / or graphically using appropriate mathematical algorithms	Create
COURSE NAME: DIGITAL LOGIC DESIGN (C213)		
C213.1	Recall the Number System and basic logic operations	Remember
C213.2	Demonstrates Bollean theorems minimization of function	Understand
C213.3	Design various combinational Circuits	Create
C213.4	Classify PROM,PAL and PLA	Understand
C213.5	Design various Synchronous and Asynchronous Counters	Create
C213.6	Analyze Clocked Sequential Circuits	Analyze
COURSE NAME: PYHTON PROGRAMMING (C214)		
C214.1	Illustrate the usefulness of python as scripting language and how to run python scripts.	Apply
C214.2	Develop python programs using operators, loops and decision statements.	Create
C214.3	Evaluating data in python data structures (lists, tuples, dictionaries) using indexing & slicing techniques.	Evaluate
C214.4	Creating python programs using packages, functions, modules and pip	Apply
C214.5	Apply object oriented programming concepts and incorporate exception handling in python programs.	Apply
C214.6	Demonstrate the role of testing in scientific computing and develop python codes to perform mathematical calculations and scientific simulations.	Understand
COURSE NAME: DATA STRUCTURE THROUGH CPP (C215)		
C215.1	Distinguish between procedures and object oriented programming and solve applications in Mathematics	Analyze

C215.2	Apply advanced data structure strategies for exploring complex data structures.	Apply
C215.3	Compare and contrast various data structures and design techniques in the area of Performance	Understand
C215.4	Apply data structures into the applications such as binary search trees, AVL and B Trees	Apply
C215.5	Develop all data structures like stacks, queues, trees, lists and graphs and compare their Performance and trade offs	Create
C215.6	Analze the data using searching and sorting techniques.	Analyze
COURSE NAME: COMPUTER GRAPHICS (C216)		
C216.1	Build knowledge about device level algorithms for displaying 2D output primitives for graphics system.	Apply
C216.2	Recall knowledge about the basic concepts of how to represent 3D objects in 2D.	Remember
C216.3	Compare and analyze different color models and basic concepts of OpenGL.	Analyze
C216.4	Building camera in a program to add textures and shadows by using 3D modeling and rendering techniques.	Apply
C216.5	Create images by using iterated functions.	Create
C216.6	Apply knowledge of Ray tracing with different primitives.	Apply
COURSE NAME: DATA STRUCTURES THROUGH C++ LAB (C217)		
C217.1	Distinguish between procedures and object oriented programming and solve applications in Mathematics	Analyze
C217.2	Apply advanced data structure strategies for exploring complex data structures.	Apply
C217.3	Compare and contrast various data structures and design techniques in the area of Performance	Understand
C217.4	Apply data structures into the applications such as binary search trees, AVL and B Trees	Apply
C217.5	Develop all data structures like stacks, queues, trees, lists and graphs and compare their Performance and trade offs	Create
C217.6	Analze the data using searching and sorting techniques.	Analyze
COURSE NAME: PYTHON PROGRAMMING LAB (C218)		
C218.1	Illustrate the usefulness of python as scripting language and how to run python scripts.	Apply

C218.2	Develop python programs using operators, loops and decision statements.	Create
C218.3	Evaluating data in python data structures (lists, tuples, dictionaries) using indexing & slicing techniques.	Evaluate
C218.4	Creating python programs using packages, functions, modules and pip	Apply
C218.5	Apply object oriented programming concepts and incorporate exception handling in python programs.	Apply
C218.6	Demonstrate the role of testing in scientific computing and develop python codes to perform mathematical calculations and scientific simulations.	Understand
II YEAR II SEMESTER		
COURSE NAME: SOFTWARE ENGINEERING (C221)		
C221.1	Ability to apply software engineering principles and techniques.	Apply
C221.2	Basic knowledge and understanding of the Software Design Life Cycle systems.	Understand
C221.3	Ability to develop, maintain and evaluate large-scale software systems.	Analyze
C221.4	To produce efficient, reliable, robust and cost-effective software solutions.	Create
C221.5	Ability to perform independent research and analysis.	Apply
C221.6	Demonstrate an ability to use the techniques and tools necessary for engineering practice.	Understand
COURSE NAME: JAVA PROGRAMMING (C222)		
C222.1	Illustrate Java based software code of medium-to-high complexity.	Understand
C222.2	Defining and implementing basic concepts of Programming language.	Remember
C222.3	Apply the basic approaches to design software applications by using an integrated development environment to develop object oriented java programs.	Apply
C222.4	Design elementary modifications to Java programs that solve real world problems.	Create
C222.5	Analyze applications of Java Applets & Event handling.	Analyze
C222.6	Choose and collect the basic principles of programming applications with Graphical user interface.	Evaluate
COURSE NAME: ADVANCE DATA STRUCTURES (C223)		
C223.1	Demonstrate an understanding of external memory and external search and sorting.	Understand

C223.2	Analyze the space and time complexity of the algorithms studied in the course	Analyze
C223.3	Design a variety of applications using advanced data structures (hash tables, priority queues, balanced search trees, graphs)	Create
C223.4	Identify different solutions for a given problem; analyze advantages and disadvantages to different solutions	Analyze
C223.5	Demonstrate an understanding of simple Entity-Relationship models for databases.	Understand
C223.6	Develop applications and a brief understanding of Binary Search Structures	Create
COURSE NAME: COMPUTER ORGANIZATION (C224)		
C224.1	Understand the computer generations and types and peripheral devices	Understand
C224.2	Apply the machine level instructions and using multiple devices through interrupts	Apply
C224.3	Analyze the effective address of an operand by addressing modes.	Analyze
C224.4	Apply the organization of I/O and memory devices.	Apply
C224.5	Understand memory organization and store the various fields in memory system.	Understand
C224.6	Develop micro programs using micro instructions.	Create
COURSE NAME: FORMAL LANGUAGES AND AUTOMATA THEORY (C225)		
C225.1	Demonstrate basic concepts in automata theory ,abstract models of computing including deterministic(DFA),non- deterministic and transducers	Understand
C225.2	Identify regular expressions, grammars and automata (recognizers) for different language classes.	Apply
C225.3	Relate Formal language and grammars with the help of Chomsky hierarchy.	Remember
C225.4	Perceive the hierarchy of problems arising in the computer science.	Evaluate
C225.5	Design Turing machine apply mathematical and formal techniques for solving problems in computer science.	Create
C225.6	relating to the theory of computation and computational models including (but not limited to) decidability and intractability.	Evaluate
COURSE NAME: PRINCIPLES OF PROGRAMMING LANGUAGES (C226)		
C226.1	Identify the appropriate syntax and semantics and apply solutions when interacting with programming languages.	Apply

C226.2	Interpret the Syntax and semantic and formulate for selecting data types and basic statements for programming languages.	Understand
C226.3	Choose the design and develop Subprograms for appropriate high level language.	Create
C226.4	Assess the comparative advantages and disadvantages of Object oriented languages.	Evaluate
C226.5	Identify the important issues of Functional programming languages.	Apply
C226.6	Analyze the concepts and features of Logic programming languages.	Analyze
COURSE NAME:ADVANCED DATA STRUCTURES LAB (C227)		
C227.1	Demonstrate an understanding of external memory and external search and sorting.	Understand
C227.2	Analyze the space and time complexity of the algorithms studied in the course	Analyze
C227.3	Design a variety of applications using advanced data structures (hash tables, priority queues, balanced search trees, graphs)	Create
C227.4	Identify different solutions for a given problem; analyze advantages and disadvantages to different solutions	Analyze
C227.5	Demonstrate an understanding of simple Entity-Relationship models for databases.	Understand
C227.6	Develop applications and a brief understanding of Binary Search Structures	Create
COURSE NAME:JAVA PROGRAMMING LAB (C228)		
C228.1	Illustrate Java based software code of medium-to-high complexity.	Understand
C228.2	Defining and implementing basic concepts of Programming language.	Remember
C228.3	Apply the basic approaches to design software applications by using an integrated development environment to develop object oriented java programs.	Apply
C228.4	Design elementary modifications to Java programs that solve real world problems.	Create
C228.5	Analyze applications of Java Applets & Event handling.	Analyze
C228.6	Choose and collect the basic principles of programming applications with Graphical user interface.	Evaluate
III YEAR I SEMESTER		
COURSE NAME: COMPILER DESIGN (C311)		

C311.1	To understand various phases of a compiler.	Understand
C311.2	Understand, design and implement a lexical analyzer.	Analyze
C311.3	To understand process, design and implementation complex solutions and environmental considerations of a parser.	Apply
C311.4	Have a good understanding and design code generation schemes.	Apply
C311.5	Acquires the knowledge on optimization of code and runtime environment.	Evaluate
C311.6	To implement various parsing, conversion, optimization and code generation algorithms for the design of a compiler and generate target code.	Create
COURSE NAME: UNIX PROGRAMMING (C312)		
C312.1	Make use of different built in unix commands in real time environment.	Apply
C312.2	Analyze the working of the user defined commands and will be able change the permissions associated with files.	Analyze
C312.3	Interpret the concept of Shell and the different usage of the commands in shell.	Understand
C312.4	Analyzing various filter commands and Develop shell scripts in AWK language	Analyze
C312.5	Apply the knowledge of basic Unix communications and networking commands for different problems.	Apply
C312.6	Scripts and programs will demonstrate effective use of structured programming.	Understand
COURSE NAME: OBJECT ORIENTED ANALYSIS AND DESIGN USING UML (C313)		
C313.1	Find the solutions to the complex problems using object oriented approach	Remember
C313.2	Identify and Model classes and Objects of the problem domain	Apply
C313.3	Design static parts of a software system by using UML Class and Object diagrams	Create
C313.4	Examine Basic Behavioral Modeling of a Software System using Use Case, Interaction and Activity Diagrams	Analyze
C313.5	Create Advanced Behavioral Modeling of a Software System using State machine and State chart Diagrams	Create
C313.6	Develop Real time software applications by using UML Static and dynamic diagrams	Create
COURSE NAME: DATABASE MANAGEMENT SYSTEMS (C314)		

C314.1	An ability to determine the basic concepts and applications of database systems.	Evaluate
C314.2	An ability to describe data models and schemas in DBMS	Apply
C314.3	An ability to understand the Relational database system using relational operators.	Understand
C314.4	An ability to use SQL- Structured Query Language on Database	Create
C314.5	An ability to analyze the functional dependencies and design of the database	Analyze
C314.6	An ability to analyze the concept of Transactions and Recovery system and also Generate Forms and Reports of Database.	Create
COURSE NAME: OPERATING SYSTEMS (C315)		
C315.1	Design various Scheduling algorithms.	Create
C315.2	Apply the principles of concurrency.	Apply
C315.3	Design and implementing deadlock, prevention and avoidance algorithms.	Create
C315.4	Compare and contrast various memory management schemes.	Understand
C315.5	Design and Implement a prototype file systems.	Create
C315.6	Perform administrative tasks on Linux Servers	Apply
COURSE NAME: UNIFIED MODELING LAB (C316)		
C316.1	Find the solutions to the complex problems using object oriented approach	Remember
C316.2	Identify and Model classes and Objects of the problem domain	Apply
C316.3	Design static parts of a software system by using UML Class and Object diagrams	Create
C316.4	Examine Basic Behavioral Modeling of a Software System using Use Case, Interaction and Activity Diagrams	Analyze
C316.5	Create Advanced Behavioral Modeling of a Software System using State machine and State chart Diagrams	Create
C316.6	Develop Real time software applications by using UML Static and dynamic diagrams	Create
COURSE NAME: OPERATING SYSTEM & LINUX PROGRAMMING LAB (C317)		
C317.1	Design various Scheduling algorithms.	Create
C317.2	Apply the principles of concurrency.	Apply

C317.3	Design and implementing deadlock, prevention and avoidance algorithms.	Create
C317.4	Analyzing various filter commands and Develop shell scripts in AWK language	Analyze
C317.5	Apply the knowledge of basic Unix communications and networking commands for different problems.	Apply
C317.6	Scripts and programs will demonstrate effective use of structured programming.	Understand
COURSE NAME: DATABASE MANAGEMENT SYSTEM LAB (C318)		
C318.1	An ability to determine the basic concepts and applications of database systems.	Evaluate
C318.2	An ability to describe data models and schemas in DBMS	Apply
C318.3	An ability to understand the Relational database system using relational operators.	Understand
C318.4	An ability to use SQL- Structured Query Language on Database	Create
C318.5	An ability to analyze the functional dependencies and design of the database	Analyze
C318.6	An ability to analyze the concept of Transactions and Recovery system and also Generate Forms and Reports of Database.	Create
COURSE NAME: PROFESSIONAL ETHICS & HUMAN VALUES (C319)		
C319.1	Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field	Understand
C319.2	Identify the multiple ethical interests at stake in a real-world situation or practice	Understand
C319.3	Articulate what makes a particular course of action ethically defensible	Apply
C319.4	Assess their own ethical values and the social context of problems	Analyze
C319.5	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
III YEAR II SEMESTER		
COURSE NAME: COMPUTER NETWORKS (C321)		
C321.1	Summarize OSI and TCP/IP models and physical layer	Understand
C321.2	Survey physical layer and Transmission media types.	Analyze
C321.3	Survey MAC layer protocols and LAN technologies.	Analyze
C321.4	Classify routing and congestion control algorithms	Understand
C321.5	Defining the mechanisms in transport layer to data transfer	Apply

C321.6	Explain how internet works	Understand
COURSE NAME: DATA WAREHOUSING AND MINING (C322)		
C322.1	Demonstrate the stages in building data warehouse, data mining principles and techniques.	Understand
C322.2	Apply preprocessing techniques, organize and prepare the data needed for data mining using preprocessing.	Apply
C322.3	Apply data mining methods like classification on large data sets using Decision Tree.	Apply
C322.4	Evaluate Bayes Theorem to implement Naive Bayesian classification on large data sets.	Evaluate
C322.5	Analyze and evaluate performance of algorithms for association rules.	Analyze
C322.6	Apply and analyze clustering techniques.	Analyze
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. Derive and solve recurrences describing. The performance of divide and-conquer algorithms	Understand
C323.3	Demonstrate the greedy paradigm and explain when an algorithmic design Situation calls for it.	Understand
C323.4	Solve dynamic programming algorithms, and analyze them	Apply
C323.5	Determine the backtracking paradigm and explain when an algorithmic design Situation calls for it. Recite algorithms that employ this paradigm.	Evaluate
C323.6	Applies the branch & bound paradigm and explain when an algorithmic design situation calls for it. Synthesize branch & bound algorithms, and analyze them	Apply
COURSE NAME: SOFTWARE TESTING METHODOLOGIES(C324)		
C324.1	Interpret the purpose of testing, model for testing, apply software testing knowledge and engineering methods.	Understand
C324.2	Develop by conducting and implementing test process for a software testing project.	Develop
C324.3	Identify various software testing problems, and solve these problems by Designing and selecting software test models, criteria, strategies, and methods.	Apply

C324.4	Choose various communication methods and skills to communicate with their team mates to conduct their practice-oriented software testing projects.	Apply
C324.5	Analyze the needs of software test automation, and define and develop a test Tool to support test automation.	Analyze
C324.6	Develop software testing methods and modern software testing tools for their testing projects.	Apply
COURSE NAME: INTERNET OF THINGS (C325)		
C325.1	Design and implements IOT Technology in its application areas.	Create
C325.2	Distinguish the revolution of Internet in Mobile Devices, Cloud & Sensor Networks	Analyze
C325.3	Analyzing various communication principles for web connectivity.	Analyze
C325.4	Apply knowledge of security, communication and ethical issues in the Internet	Apply
C325.5	Analyze and adapt Data Management and business processing in IoT	Analyze
C325.6	Apply and implement IoT in Industrial and Commercial Building Automation and Real World Design Constraints using cloud platform	Apply
COURSE NAME: NETWORK PROGRAMMING LAB (C326)		
C326.1	Summarize OSI and TCP/IP models and physical layer	Understand
C326.2	Survey physical layer and Transmission media types.	Analyze
C326.3	Survey MAC layer protocols and LAN technologies.	Analyze
C326.4	Classify routing and congestion control algorithms	Understand
C326.5	Defining the mechanisms in transport layer to data transfer	Apply
C326.6	Explain how internet works	Understand
COURSE NAME: SOFTWARE TESTING LAB (C327)		
C327.1	Interpret the purpose of testing, model for testing, apply software testing knowledge and engineering methods.	Understand
C327.2	Develop by conducting and implementing test process for a software testing project.	Develop
C327.3	Identify various software testing problems, and solve these problems by Designing and selecting software test models, criteria, strategies, and methods.	Apply
C327.4	Choose various communication methods and skills to communicate with their team mates to conduct their practice-oriented software testing projects.	Apply

C327.5	Analyze the needs of software test automation, and define and develop a test Tool to support test automation.	Analyze
C327.6	Develop software testing methods and modern software testing tools for their testing projects.	Apply
COURSE NAME: DATA WAREHOUSING AND MINING LAB (C328)		
C328.1	Demonstrate the stages in building data warehouse, data mining principles and techniques.	Understand
C328.2	Apply preprocessing techniques, organize and prepare the data needed for data mining using preprocessing.	Apply
C328.3	Apply data mining methods like classification on large data sets using Decision Tree.	Apply
C328.4	Evaluate Bayes Theorem to implement Naive Bayesian classification on large data sets.	Evaluate
C328.5	Analyze and evaluate performance of algorithms for association rules.	Analyze
C328.6	Apply and analyze clustering techniques.	Analyze
COURSE NAME: INTELLECTUAL PROPERTY RIGHTS (C329)		
C329.1	Interpret the Concept of IPR Importance and mechanisms.	Understand
C329.2	Evaluate the copyrights and copyright registration.	Evaluate
C329.3	Identify the patents and Patent Cooperation Treaty.	Apply
C329.4	Formulate Trademarks and Likelihood of Confusion - Dilution of Ownership.	Create
C329.5	Identify the concepts of trade secrets Trade Secret Litigation.	Apply
C329.6	Formulating the cyber laws and cybercrimes.	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).	Understand
C411.2	Apply various symmetric key cryptography algorithms .	Apply
C411.3	Demonstrate number theory and apply it in asymmetric key cryptography algorithms .	Understand
C411.4	Apply various hash functions and digital signature concepts to achieve data authentication and integrity.	Apply
C411.5	Know how to provide security to transport layer and E-mail .	Remember
C411.6	Recognize the concept of IP security at network layer and Intrusion Detection System.	Understand

COURSE NAME:SOFTWARE ARCHITECTURE & DESIGN PATTERNS(C412)		
C412.1	Understand interrelationships, principles and guidelines governing architecture and evolution over time	Understand
C412.2	Analyze the architecture and build the system from the components	Analyze
C412.3	Prepare creational patterns that deal with object creation mechanisms	Create
C412.4	Prepare structural patterns that ease the design by identifying a simple way to realize relationships among entities	Apply
C412.5	Learn behavioural patterns that identify common communication patterns between objects and realize these patterns.	Apply
C412.6	Classify various case studies	Analyze
COURSE NAME: WEB TECHNOLOGIES (C413)		
C413.1	Define Web and Implement the concept of web page development to design real world applications	Create
C413.2	Compare the development of the web application performance using different set of web development tools like HTML, XHTML, CSS, JAVASCRIPT, XML, CGI-PERL, RAILS.	Create
C413.3	Apply the usage of web development tools to serve the purpose of different end users of Internet.	Analyze
C413.4	Interpret an existing static web application to make it a robust one and Integrate dynamic features of web development	Apply
C413.5	Utilize network integrated development environment (IDE) and various platforms to monitor develop and use web applications.	Apply
C413.6	Define new simple client-side scripts using AJAX	Create
COURSE NAME: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (C414)		
C414.1	Interpret the fundamental concepts of managerial economics.	Understand
C414.2	Classify and compare various costs in managerial decision making process.	Analyze
C414.3	Analyze different kinds of markets and various pricing strategies.	Analyze

C414.4	Identify various forms of business optimization and their procedures.	Apply
C414.5	Identity fundamental concepts of accounting and analyze financial statements.	Analyze
C414.6	Evaluates various alternative investment proposals to make a better capital budgeting decision.	Evaluate
COURSE NAME: BIG DATA ANALYTICS (C415)		
C415.1	Define what Big Data is and why classical data analysis techniques are no longer adequate	Remember
C415.2	Summarize the benefits that Big Data can offer to businesses and organizations	Understand
C415.3	Build fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics	Create
C415.4	Apply data modeling techniques to large data sets.	Apply
C415.5	Create applications for Big Data analytics.	Create
C415.6	Build a complete business data analytic solution.	Create
COURSE NAME: CLOUD COMPUTING (C416)		
C416.1	Identify the appropriate cloud services for a given application.	Apply
C416.2	Assess the comparative advantages and disadvantages of Virtualization technology	Evaluate
C416.3	Assessing of economics, financial, and technological implications for selecting cloud computing for an organization	Evaluate
C416.4	Create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds	Create
C416.5	Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-based applications.	Evaluate
C416.6	Identify security implications in cloud computing	Apply
COURSE NAME: SOFTWARE ARCHITECTURE& DESIGN PATTERNS LAB (C417)		
C417.1	Understand interrelationships, principles and guidelines governing architecture and evolution over time	Understand
C417.2	Analyze the architecture and build the system from the components	Analyze
C417.3	Prepare creational patterns that deal with object creation mechanisms	Create

C417.4	Prepare structural patterns that ease the design by identifying a simple way to realize relationships among entities	Apply
C417.5	Learn behavioural patterns that identify common communication patterns between objects and realize these patterns.	Apply
C417.6	Classify various case studies	Analyze
COURSE NAME: WEB TECHNOLOGIES LAB (C418)		
C418.1	Define Web and Implement the concept of web page development to design real world applications	Create
C418.2	Compare the development of the web application performance using different set of web development tools like HTML, XHTML, CSS, JAVASCRIPT, XML, CGI-PERL, RAILS.	Create
C418.3	Apply the usage of web development tools to serve the purpose of different end users of Internet.	Analyze
C418.4	Interpret an existing static web application to make it a robust one and Integrate dynamic features of web development	Apply
C418.5	Utilize network integrated development environment (IDE) and various platforms to monitor develop and use web applications.	Apply
C418.6	Define new simple client-side scripts using AJAX	Create
IV YEAR II SEMESTER		
COURSE NAME:DISTRIBUTED SYSTEMS (C421)		
C421.1	Demonstrate the concepts of examples of distributed systems and architectural models	Understand
C421.2	Identify the features and applications of important standard protocols which are used in distributed systems	Apply
C421.3	Develop the concepts of RMI, RPC and Event notifications	Create
C421.4	Distinguish the concepts of operating systems ,Processes and Threads	Analyze
C421.5	Design the concept of distributed file systems, Peer to peer systems and Distributed Mutual Exclusion, Elections, Multicast Communication.	Create
C421.6	Develop the concepts of transaction management and replications	Create
COURSE NAME:MANAGEMENT SCIENCE (C422)		

C422.1	Interpret the management functions and decision making process.	Understand
C422.2	Classify the materials management and inventory management techniques.	Analyze
C422.3	Explain the concepts of functional management and marketing management.	Understand
C422.4	Solve the concepts of project management problems.	Apply
C422.5	Explain the concepts of strategic management.	Understand
C422.6	Elaborate the contemporary Management Practices.	Create
COURSE NAME: MACHINE LEARNING (C423)		
C423.1	Recognize thecharacteristics of machine learning that make it useful to real world problems	Understand
C423.2	Characterize machine learning algorithms as supervised, semi-supervised and unsupervised.	Remember
C423.3	Have heard of a few machine learning toolboxes like tree model and rule model .	Analyze
C423.4	Be able to Use Linear models and distance based models	Apply
C423.5	Be able to use Probabilistic models	Apply
C423.6	Understand the concept behind neural networks for learning non-linear functions	Understand
COURSE NAME: ARTIFICIAL NEURAL NETWORKS (C4242)		
C4242.1	Summarizing the functions of Biological neurons and Artificial Neuron Models.	Understand
C4242.2	Implementing Various Supervised Learning Mechanisms	Apply
C4242.3	Solving the Classification problem using Perceptron /Bayesian Classifier	Apply
C4242.4	Outlining the Structures of Feed Forward Neural networks	Analyze
C4242.5	Attributing the features of Radial Basis Function Networks	Analyze
C4242.6	Solving the Linear Separability Problem using Support Vector Machines	Apply
COURSE NAME: SEMINAR (C425)		
C425.1	To study research papers for understanding of a new field, in the absence of a textbook, to summarise and review them.	Understand
C425.2	To identify promising new directions of various cutting edge technologies	Apply

C425.3	To impart skills in preparing detailed report describing the project and results	Understand
C425.4	To effectively communicate by making an oral presentation before an evaluation committee	Evaluate
C425.5	demonstrate the ability to evaluate, credit, and synthesize sources	Understand
C425.6	Identify and understand assumptions, theses, and arguments that exist in the work of authors	Analyze
COURSE NAME: PROJECT (C426)		
C426.1	Learn about different software development process models and software engineering principles and develop an ability to apply them to software design of real life problems	Apply
C426.2	Make use of literature survey and analyze it	Evaluate
C426.3	Design models, database and test cases and use tools for testing a project	Create
C426.4	Simulate or develop a program or prototype for the given project	Apply
C426.5	Utilize conventional or latest technologies for problem solving and identify the future enhancement for the project work	Apply
C426.6	Prepare a thesis or report in a required format and present their work to the panel	Create

Vijayalaxmi

PRINCIPAL
BVC Institute of Technology & Science
BATLAPALEM, AMALAPURAM - 533 221

BVC INSTITUTE OF TECHNOLOGY & SCIENCE * AMALAPURAM

Head of the Dept.,
Department of CSE
BVCITS, Amalapuram