BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(Approved by AICTE. New Delhi, Accredited by NAAC 'A' Grade
Permanently Affiliated to JNTUK, Kakinada)
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

BATCH: 2018-22

COURSE OUTCOMES

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