BVRIT HYDERABAD
College of Engineering for Women
Department of Computer Science and Engineering
Course Outcomes

II Year I Sem-R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C211	Analog and Digital Electronics	C211.1	Analyze the construction, principle of operation and characteristics of PN junction diode.
		C211.2	Differentiate various types of diodes and their applications.
		C211.3	Analyze the construction, principle of operation, characteristics and applications of BJT and FET.
		C211.4	Design biasing circuits to maintain stable operating point based on given specifications.
		C211.5	Realize logic circuits using diodes and transistors.
		C211.6	Design and analyze simple combinational and sequential circuits.
C212	Data Structures	C212.1	Experiment with various operations on Stacks and queues.
		C212.2	Implement various operations on linear data structures and its applications.
		C212.3	Design programs using a variety of data structures like Hash Table Representation.
		C212.4	Experiment with various operations on non linear data structures.
		C212.5	Choose appropriate sorting technique for a given problem.
		C212.6	Exploring Pattern matching algorithms and suffix Tries.
C213	Computer Oriented Statistical Methods	C213.1	Distinguish between discrete and continuous probability. Distributions.
		C213.2	Analyze and interpret statistical data using appropriate

				probability distributions.
			C213.3	Apply sampling distributions in real world problems.
			C213.4	Estimate the value for a given parameter by choosing appropriate method.
			C213.5	Apply suitable test to accept or reject a given hypothesis.
			C213.6	Apply Stochastic process and Markov process to solve various problems.
			C214.6	Perform Parallel Processing using suitable mechanism
C215	Object Oriented Programming using C++		C215.1	Make use of object oriented paradigm with concepts of classes and objects.
			C215.2	Design and Implement programs using C++
			C215.3	Apply concepts of Inheritance in real time problems.
			C215.4	Design solutions for real time problems using Polymorphism and Abstract classes.
			C215.5	Apply features of stream I/O, various file handling techniques in C++
			C215.6	Analyze the concept Exception handling using C++
C217	Data Structures Lab		C217.1	Implement various linear data structures.
			C217.2	Implement various non linear data structures.
			C217.3	Compare various searching and sorting algorithms.
			C217.4	Ability to implement trees and graphs traversals.
C218	IT Workshop Lab		C218.1	Construct a Personal Computer and prepare the computer ready to use.
			C218.2	Prepare the Documents & slide presentations using Word processors and presentation tools.
			C218.3	Apply internet concepts to connect two or more computers for information sharing.
			C218.4	Build a dual mode operating system PC by installing OS Software.
C219	C++ Programming Lab		C219.1	Apply Object oriented features and C++ concepts.
			C219.2	Apply the concept of polymorphism and inheritance.
			C219.3	Implement exception handling and templates.

Course Code	Course Name	CO No.	Course Outcomes
		C219.4	Develop applications using Console I/O and File I/O.
C21A	GS Lab	C21A.1	Develop a better understanding of important issues related to gender in contemporary India
		C21A.2	Analyze basic dimensions of the biological, sociological, psychological and legal aspects of gender
		C21A.3	Develop a sense of appreciation of women in all walks of life and will be equipped to work and live together as equals.
		C21A.4	Examine the new laws for women protection & relief, and empower students to understand and respond to gender violence

III Year I Sem-R18

Course Code	Course Name	CO No.	Course Outcomes
C311	Formal Languages and Automata Theory	C311.1	Design FA machines, minimize, and achieve conversions among them.
		C311.2	Make use of Regular expressions and Test for regular languages
		C311.3	Derive sentential forms from CFG and remove ambiguity
		C311.4	Minimize and design recognizers for CFG.
		C311.5	Design appropriate Turing Machine for a given problem
		C311.6	Identify undecidability in NREL, REL and RL
C312	Software Engineering	C312.1	Illustrate process framework and models for the development based on nature of the software.
		C312.2	Analyze the requirements to select a model and for preparation of SRS document.
		C312.3	Choose appropriate model to create architecture by using design principles.
		C312.4	Apply various testing strategies to validate the software quality.
		C312.5	Illustrate the importance of product metrics in software

			development.
		C312.6	Develop reliable software by managing risk and following Quality Standards.
C313	Computer Networks	C313.1	Examine various reference models in terms of protocols, layer interfaces, connecting and grouping of users.
		C313.2	Analyze counter measures like error detection, correction, flow control and medium access protocols in data link layer.
		C313.3	Identify the suitable routing algorithm in Network layer.
		C313.4	Identifying suitable hardware components for connecting hosts based on location.
		C313.5	Assess the connection management and congestion control of TCP protocols and services of various protocols in Application layer.
		C313.6	Analyze the security threats and counter mechanism to handle.
C314	Web Technologies	C314.1	Design dynamic web based applications using PHP
		C314.2	Design static web applications using HTML
		C314.3	Analyze XML tags and parsing of XML data in Java
		C314.4	Develop server side programming using servlet and connect to the database using JDBC
C315	Information Theory & coding	C315.1	Calculate information, entropy, mutual information and channel capacity for various channels
		C315.2	Compare various source coding techniques in terms of their efficiency
		C315.3	Inspect error detection and correction in linear block codes
		C315.4	Design encoder and decoder for various codes
		C315.5	Analyze the applicability of source and channel codes
		C315.6	Devise Minimum distance and BCH bounds and procedure of

			decoding BCH codes
C316	Advanced Computer Architecture	C316.1	Identify different computational models and Computer Architectures.
		C316.2	Analyze operation of parallel processing and memory hierarchy and the range of performance issues influencing its design.
		C316.3	Classify the performance of different pipelined &non- pipelined processors.
		C316.4	Analyze architectural features of advanced processors like Superscalar processors, multiprocessors.
		C316.5	Choose multiprocessors & thread level parallelism using shared, distributed memory models.
		C316.6	Develop the design techniques of Scalable and multithreaded Architecture.
C317	Data Analytics	C317.1	Fetch data from various sources and make it ready for analysis
		C317.2	Make use of various tools and technologies for data analysis
		C317.3	Apply regression techniques to data and evaluate performance
		C317.4	build supervised and unsupervised learning models for object segmentation
		C317.5	Build models for time series and evaluate performance
		C317.6	Visualize the data and interpret the insights exist in data
C318	Image Processing	C318.1	Demonstrate the knowledge of the basic concepts of the two-dimensional signal acquisition, sampling and quantization and its applications of Image Processing
		C318.2	Model of spatial and frequency filtering technique for image enhancement.
		C318.3	Demonstration of the knowledge of 2Dimensional transformation techniques.
		C318.4	Implement the image enhancement, segmentation, restoration, and compression techniques and problems.
		C318.5	Implement image processing algorithms using Open Source / Image Processing Tools / Matlab Software
		C318.6	Professional Contribution in the field of Digital Image Processing
C319	Principles	C319.1	Identify the building blocks of various Programming languages

		C319.2	Implement various methods to describe syntax and semantics of programming languages
	of Programming Languages	C319.3	Examine fundamentals like Data types, Control Structures etc. of various programming languages
		C319.4	Make use of Subprograms and ADT in implementing business logic
		C319.5	Apply the techniques to handle Concurrency, Exceptions and Events in programming
		C319.6	Outline Functional, Logic and Scripting Programming Language Concept
C31A	Computer Graphics	C31A.1	Analyze the functionality of various Input , output devices
		C31A.2	Design algorithms for primitive components and to fill 2-D shapes
		C31A.3	Perform transformations and create views for 2-D co-ordinates
		C31A.4	Perform transformations and create views for 3-D co-ordinates
		C31A.5	Apply surface detection methods
		C31A.6	Design and Create a Graphics Visualization and its applications using OpenGL or Opensource software
C31B	Advanced Operating Systems	C31B.1	Draw inference on the various design approaches of advanced operating systems
		C31B.2	Analyze the design issues of distributed operating systems.
		C31B.3	Inspect and Identify the advantages and challenges in designing distributed algorithms for different primitives like mutual exclusion, deadlock detection, agreement, etc.
		C31B.4	Examine design issues and computational performance of multi-processor operating systems.
		C31B.5	Identify the requirements of Distributed File System and Distributed Shared Memory.
		C31B.6	Analyze how computing power is created and synchronized in Distributed systems
C31C	Information Retrieval Systems	C31C.1	Implementing Information Retrieval system capabilities and Digital Libraries
		C31C.2	Implement the Indexing and the Data Structures
		C31C.3	Compute the Automatic indexing, Document and term clustering .
		C31C.4	Apply user search techniques to improve the information visualization.

		C31C.5	Implementation of Text Search Algorithms.
		C31C.6	Build the working model for multimedia information retrieval system.
C31D	Distributed Systems	C31D.1	Analyze the architecture and design of distributed database systems.
		C31D.2	Explore the objectives and algorithms for distributed query processing.
		C31D.3	Examine the mechanisms of concurrency control and deadlock management.
		C31D.4	Evaluate the measures of distributed systems reliability and fault tolerance.
		C31D.5	Illustrate the importance of parallel database systems.
		C31D.6	Examine the concepts of object oriented database management systems.
C31E	Natural Language Processing	C31E.1	Outline the sensitivity to linguistic phenomena and ability to model using syntax, semantics and pragmatics with formal grammars.
		C31E.2	Students will able to understand and carry out proper experimental methodology for training and evaluating empirical NLP systems
		C31E.3	Manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods with ambiguity resolution.
		C31E.4	Design, implement, and analyze NLP algorithms for a given Natural Language tasks.
		C31E.5	Design different language Modeling Techniques using AI and ML algorithms.
		C31E.6	Design Applications of Natural Language Processing using open source / Python / NLTK and Natural Language Tools.
C31F	Software Engineering Lab	C31F.1	Analyze the problem and identify project scope and objectives and analyze the software requirements and prepare SRS document.
		C31F.2	Develop risk strategy and QA techniques for developing quality software
		C31F.3	Design the software using UML diagrams
		C31F.4	Design the test case document
C31G	Computer Networks and Web Technologies Lab	C31G.1	Implement various algorithms of data link, network, transport and presentation layer.
		C31G.2	Evaluate data transmission techniques and monitor the network traffic using appropriate simulation tools.
		C31G.3	Develop web applications using Client Side Technologies HTML, CSS, Javascript and XML

		C31G.4	Develop web applications using Server Side Technologies PHP, Servlet and JSP
C31H	Advanced Communication Skills Lab	C31H.1	Build sound vocabulary and use functional English effectively
		C31H.2	Analyze the given text and respond appropriately and develop efficacious writing skills
		C31H.3	Develop effective speaking skills and maximize job prospects
		C31H.4	Plan and make different forms of presentation using various techniques
C31I	Intellectual Property Rights	C31I.1	Discuss the fundamental aspects of Intellectual property Rights which play a major role in development and management of innovative projects in industries.
		C31I.2	Examine Trademarks, Acquisition of Trade Mark Rights and its registration processes.
		C31I.3	Evaluate various aspects relating to copyrights and its procedure for registration processes.
		C31I.4	Evaluate with the Trade Secret Law, protection for submission, Unfair Competition
		C31I.5	Evaluate on the International Developments in Intellectual Property Rights
		C31I.6	Interpret about current trends in IPR and the steps taken by the Government of India in fostering IPR
C31J	Artificial Intelligence	C31J.1	Possess the ability to formulate an efficient problem space for a problem expressed in English
		C31J.2	Possess the ability to select a search algorithm for a problem and characterize its time and space complexities
		C31J.3	Possess the skill for representing knowledge using the appropriate technique for a given problem
		C31J.4	Apply and evaluate AI techniques to solve problems of Machine learning and Natural Language Processing
		C31J.5	Choose and implement appropriate learning algorithms for a given problem.
		C31J.6	Create an expert system to simulate behaviour of a person

IV Year I Sem-R16

Course Code	Course Name	CO No.	Course Outcomes
C411	Data Mining	C411.1	Examine data mining tasks, KDD process and challenges.
		C411.2	Apply Data Preprocessing techniques to make data sets ready to be mining.
		C411.3	Identify the frequent patterns and association rules from transactional datasets.
		C411.4	Classify the real world data into appropriate classes using various supervised learning techniques and measure its performance.
		C411.5	Apply clustering and outlier detection techniques on given data sets and evaluate goodness measures.
		C411.6	Classify web pages and extract knowledge from the web and text data.
C412	Principles of Programming Languages	C412.1	Identify the building blocks of various Programming languages.
		C412.2	Implement various methods to describe syntax and semantics of programming languages.
		C412.3	Examine data types and Control Structures for programming.
		C412.4	Develop subprograms for functional programming languages.
		C412.5	Apply object oriented concepts in programming
		C412.6	Outline Functional, Logic and Scripting Programming Language Concepts.
C 413	Python Programming	C413.1	Apply techniques to manipulate data using python core basis.
		C413.2	Distinguish the use of in-built functions, create user defined functions
		C413.3	Distinguish Lists,Tuples,Sets and dictionaries
		C413.4	Develop Object- Oriented programming as well as in depth data and information processing techniques to python program
		C413.5	Elaborate GUI applications using python
		C413.6	Model the design the high performance programs and strengthen the

			practical expertise
C 414	Mobile Application Development	C414.1	Illustrate the features, components and life cycle of Android Operating system.
		C414.2	Explore the UI components, Fragments to develop android applications in event handling.
		C414.3	Identify the importance of intents, broadcasts and notifications in Android applications.
		C414.4	Examine various file handling techniques in android.
		C414.5	Analyze the importance of database handling in Android applications.
		C414.6	Make use of android features Alarms, Internet Resources and location based services to develop Applications.
C415	Web Scripting Languages	C415.1	Make use of resources to gain some fluency programming in Ruby, Perl, TCL and TK.
		C415.2	Analyze the features of Ruby by embedding in different ways.
		C415.3	Understanding the Perl by utilizing the advanced features.
		C415.4	Explain syntax, variables and various features of TCL.
		C415.5	Elaborate strengths and weakness TCL and select an appropriate language for solving a given problem.
		C415.6	Examine the TCL and TK by embedding in different ways.
C416	Internet of Things	C416.1	Inference the impact and challenges posed by IoT networks leading to new architectural models.
		C416.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
		C416.3	Appraise the role of IoT protocols for efficient network communication.
		C416.4	Elaborate python programming with various interfacing devices using with Raspberry PI.
		C416.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
		C416.6	Construct a restful web API.
C417	Graph Theory	C417.1	Understand and apply the fundamental concepts in graph theory.
		C417.2	Interpret the basic concepts of mathematical logic.
		C417.3	Experiment with some important classes of graph theoretic problems.

		C417.4	Formulate and prove central theorems about trees, matching, connectivity, coloring and graphs.
		C417.5	Discuss about basic algorithms for graphs.
		C417.6	Elaborate to use graph theory as a modeling tool.
C418	Distributed Systems	C418.1	Classify the various distributed systems, challenges and models.
		C418.2	Evaluate the importance of clock, process synchronization and debugging of distributed systems.
		C418.3	Examine the protocol for inter process communication and distributed objects.
		C418.4	Explore distributed file system, naming services and shared memory for distributed system.
		C418.5	Categorize the distinct transactions mechanism and locks
		C418.6	Inspect concurrency control and recovery mechanisms for distributed systems.
C419	Machine Learning	C419.1	Formulate machine learning problems corresponding to different applications.
		C419.2	Analyze Decision Tree Algorithm and Back propagation algorithms.
		C419.3	Evaluate the various error estimation and weight tuning rules.
		C419.4	Examine Expectation Minimization and Hidden Markov Models.
		C419.5	Survey the instance based learning mechanisms.
		C419.6	Apply genetic Learning algorithmic approach for search and optimization problem.
C41A	Software Process and Project Management	C41A.1	Analyze the Software process maturity levels for Process Improvement and Process Assessment.
		C41A.2	Explore the Software Management Renaissance in Economics.
		C41A.3	Evaluate Life cycle phases and Artifacts in Project Management.
		C41A.4	Examine the role of workflows and checkpoints in process planning.
		C41A.5	Illustrate the importance of Project Organization, Project control and process instrumentation in Project Management.
		C41A.6	Evaluate the Project management practices with Case Studies.
C41B	Computational Complexity	C41B.1	Analyze the computational complexity and classify algorithms into appropriate complexity classes.
		C41B.2	Construct reduction of problem.
		C41B.3	Analyze algorithmic paradigms and choose appropriate paradigm for a given problem.
		C41B.4	Choose appropriate randomized algorithms for pattern recognition.
		C41B.5	Compare various graph based algorithms for approximation and randomization problems.
		C41B.6	Apply suitable data structure for complex applications.
C41C	Cloud	C41C.1	Understand various types of computing paradigms.

		C41C.2	Identify the need for Cloud Computing and its essential characteristics.
	Computi ng	C41C.3	Analyze Cloud architecture, network connectivity and its applications.
		C41C.4	Analyze management in Cloud infrastructure and approaches of Cloud migration.
		C41C.5	Identify Cloud environment using Infrastructure as a Service (IaaS) ,PaaS and SaaS.
		C41C.6	Analyze Cloud era by different platforms.
C41D	Blockch ain Technol ogy	C41D.1	Interpret the working of Block chain and crypto currency
		C41D.2	Examine the block chain concepts such as Digital identity, Neutrality etc.
		C41D.3	Interpret the working of Blockchain Genomics.
		C41D.4	Differentiate various Tokenization concepts for public adoption
		C41D.5	Critique various technical challenges, Business models and Regulations.
		C41D.6	Investigate various research advances in the area of Block chain.
C41E	Social Network Analysis	C41E.1	Distinguish between current web and Semantic web.
		C41E.2	Make use of Ontology for social network description and Analysis.
		C41E.3	Mine communities from social networks and archives.
		C41E.4	Analyze the human behaviour from social network data.
		C41E.5	Examine trust and privacy policies in social network usage.
		C41E.6	Utilize various tools for visualizing social networks.
C41F	Data Mining lab	C41F.1	Identify various data types of attributes on a given dataset.
		C41F.2	Model a decision tree for given dataset using WEKA.
		C41F.3	Construct a classifier using WEKA on a given data set and evaluate its accuracy.
		C41F.4	Design a data warehouse schema for a given case study.
C41G	Python Program ming Lab	C41G.1	Make use of python scripting for developing applications
		C41G.2	Manipulate Lists,Tuples,Sets and dictionaries
		C41G.3	Import built in libraries & Create libraries
		C41G.4	Create practical & contemporary application such as web application and data analysis
C41H	Mobile Applicat ion Develop ment Lab	C41H.1	Design android applications using layouts and controls.
		C41H.2	Design android applications using menus, notifications and files.
		C41H.3	Develop user interface applications in Android.
		C41H.4	Develop URL related applications in Android.
C41I	Web Scriptin g Languag es Lab	C41I.1	Design and test programs to solve mathematical problems.
		C41I.2	Develop programs Using Ruby Script.
		C41I.3	Develop Programs Using TCL Script.
		C41I.4	Develop Programs Using Perl Script.
C 41J	Internet of Thingss	C41J.1	Recommend to compile and execute python programming in Raspberry Pi.
		C41J.2	Make use of python program to light an LED.

		C41J.3	Build a file data as input, for the python program to light an LED.
	Lab	C41J.4	Elaborate the need for hardware and web application use in an IoT implementation.
C41K	Seminar	C41K.1	Identify emerging topic specific to the programme.
		C41K.2	Extract the information relevant to the chosen topic.
		C41K.3	Deliver the knowledge using multimedia.
		C41K.4	Answer the queries with appropriate explanation and elaboration.
		C41K.5	Compile an effective technical report, providing conclusions and proposing an appropriate future scope.
		C218.4	Build a dual mode operating system PC by installing OS Software.

Academic Year 2020-21 II Semester

II Year II Sem - R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C221	Discrete mathematics	C221.1	Apply mathematical logic to prove reason and infer various compound statements.
		C221.2	Model the mathematical problems using sets, functions and relations.
		C221.3	Prove mathematical results using various forms of Induction techniques.
		C221.4	Solve the counting problems on finite and discrete structures.
		C221.5	Solve the recursive functions by converting into recurrence relations.
		C221.6	Construct graphs to solve appropriate real-world problems.
C222	Business Economics and Financial Analysis	C222.1	Understand the Economic Concepts in business decision making process.
		C222.2	Familiarize with the cost concepts, market structures.
		C222.3	Make use of breakeven analysis, CVP Analysis, pricing strategies.
		C222.4	Examine financial accounting and analyze various financial statements.
		C222.5	Interpret various financial statements by applying different types of ratios.

		C222.6	Examine the usefulness of funds flow statement and cash flow statement for better managerial decisions.
C223	Operating Systems	C223.1	Analyze the functionalities and structure of a generic Operating System.
		C223.2	Evaluate various CPU scheduling algorithms.
		C223.3	Analyze process synchronization and IPC mechanisms.
		C223.4	Assess the techniques of deadlock avoidance and prevention.
		C223.5	Examine different Memory management techniques.
		C223.6	Explore file system interface and its operations.
C224	Database Management Systems	C224.1	Identify and classify the components of Database system.
		C224.2	Model the data using ER model and convert into Relational Model.
		C224.3	Access and manipulate the data in the databases.
		C224.4	Refine the database schema to improve data consistency.
		C224.5	Ensure the properties of transactions on databases.
		C224.6	Examine different file organizations and indexing methods.
C225	Java Programming	C225.1	Illustrate Object Oriented concepts and basics of java programming.
		C225.2	Make use of the concepts of packages and Interfaces.
		C225.3	Implement the concepts of multithreading and /or handle run time errors for Java applications.
		C225.4	Utilize collection framework and /or file management in Java applications.
		C225.5	Design real time applications using event handling concepts.
		C225.6	Develop real time GUI applications using applet, AWT, JDBC and

			swings.
C226	Operating Systems Lab	C226.1	Evaluate CPU Scheduling Algorithms and Memory management techniques.
		C226.2	Construct deadlock detection and avoidance algorithms.
		C226.3	Solve classical problems of synchronization using semaphores.
		C226.4	Evaluate inter process communication mechanisms using system calls and pipes.
C227	Database Management Systems Lab	C227.1	Design conceptual model (E-R model) for the given database.
		C227.2	Formulate the queries using DML, DDL, DCL commands.
		C227.3	Enforce integrity constraints on databases.
		C227.4	Implement triggers, stored procedures and cursors.
C228	Java Programming Lab	C228.1	Make use of JDK, Eclipse platform for developing java programs.
		C228.2	Build programs using abstract classes and multithreading concepts.
		C228.3	Develop programs using GUI components.
		C228.4	Develop Programs using Quick Sort and Bubble Sort.
C229	Constitution of India	C229.1	Understand the historical perspective of Constitution of India.
		C229.2	Analyze the features and Characteristics of Constitution of India.
		C229.3	Understand the concepts of Fundamental Rights and Duties of Indian Citizens.
		C229.4	Examine The Directive Principles of State Policy.
		C229.5	Understand the Parliamentary form of Government in India.
		C229.6	Examine the emergency provisions: National Emergency, President Rule and Financial Emergency.

III Year II Sem - R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C321	Machine Learning	C321.1	Formulate the problems of searching that converge to correct hypothesis using concept and decision tree learning.
		C321.2	Interpret face recognition, learning robot control with ANN
		C321.3	Apply Bayesian classification, Naïve Bayes theorem to analyze several learning algorithms.
		C321.4	Evaluate the accuracy of learned hypothesis with statistical methods and analyze the operations of algorithm
		C321.5	Apply genetic, sequential algorithms to perform simulated evaluation of learning and optimization problems
		C321.6	Formulate the general hypothesis with inductive and analytical learning.
C322	Compiler Design	C322.1	Illustrate the functionality of compiler phases.
		C322.2	Apply practical aspects of automata theory.
		C322.3	Design parsers for a given CFG.
		C322.4	Construct SDT for various aspects including Intermediate Code.
		C322.5	Make use of relevant data structures.
		C322.6	Apply various code generation and optimization techniques.
C323	Design and Analysis of Algorithms	C323.1	Analyze the performance of algorithms and represent using relevant notations.
		C323.2	Model real world applications using sets graphs and trees.
		C323.3	Explore basic techniques for designing algorithm using divide – conquer & Greedy approach to various problems.
		C323.4	Identify suitable design paradigms to improve the solution space using Dynamic Programming & Backtracking method.
		C323.5	Reduce the search space of a problem using bounding functions.
		C323.6	Categorize problems into NP hard & NP Complete.
C324	Concurrent Programming	C324.1	Understand the use of shared objects for communication and co-ordination among concurrent processes.
		C324.2	Apply mutual exclusion and condition synchronization in multithreaded processes.
		C324.3	Design concurrent programs using blocking and non-blocking concurrent objects
		C324.4	Solve synchronization problems by identifying a set of primitive synchronization operations.
		C324.5	Implement multithreading using various synchronization mechanisms.
		C324.6	Implement concurrent queues and stacks to achieve high degree of parallelism.
C325	Network	C325.1	Examine major protocols used for inter process communication

	Programming	C325.2	Analyzing Client server communication, elementary UDP Sockets programming, I/o multiplexing
		C325.3	Apply the concepts related to Inter process communication using sockets.
		C325.4	Explain network services that communicate through Internet
		C325.5	Access various kinds of Broadcasting and Multicasting mechanisms.
		C325.6	Design robust socket-based applications
C326	Scripting Languages	C326.1	Make use of resources to gain some fluency programming in Ruby, Perl, TCL and TK
		C326.2	Analyze the features of Ruby by embedding in different ways
		C326.3	Understanding the Perl by utilizing the advanced features
		C326.4	Explain syntax, variables and various features of TCL
		C326.5	Elaborate strengths and weakness TCL and select an appropriate language for solving a given problem
		C326.6	Examine the TK by embedding in different ways
C327	Mobile Application Development	C327.1	Analyze the features, components and life cycle of Android Operating system
		C327.2	Design Android application with UI components, Fragments and event handling
		C327.3	Identify the importance of intents in Android applications development
		C327.4	Develop Android applications using broadcasts and notifications
		C327.5	Examine the data persistence mechanism using Files and Shared Preferences
		C327.6	Develop Android application to perform operations with SQLite database
C328	Software Testing Methodologies	C328.1	Identify the need of testing and understand the use of path testing
		C328.2	Compare and contrast transaction flow testing, dataflow testing and domain testing strategies
		C328.3	Examine path products, expressions, regular expression and flow anomaly detection in testing process.
		C328.4	Choose appropriate path expression, KV charts, specifications in logic based testing.
		C328.5	Analyze state graphs, graph matrix and their applications in transition testing.
		C328.6	Analyze graph matrices, matrix properties and their applications in building tools like JMeter, Win-runner etc.
C329	Machine Learning Lab	C329.1	Compare Machine Learning algorithms based on their advantages and limitations and use the best one according to situation
		C329.2	Interpret and understand modern notions in data analysis-oriented computing
		C329.3	Apply common Machine Learning algorithms in practice and

			implement.
		C329.4	Experiment with real-world data using Machine Learning algorithms.
C32A	Compiler Design Lab	C32A.1	Identify the practical approach of how a compiler works
		C32A.2	Construct top down and bottom up parse tools
		C32A.3	Construct LEX and YACC programs
		C32A.4	Develop new computer languages
C32B	Concurrent Programming Lab	C32B.1	Implement mutual exclusion, dead lock free and starvation free multi thread programming.
		C32B.2	Create concurrent FIFO queue data structure using multi thread programming
		C32B.3	Design a consensus object by implementing mutual exclusion lock using CompareAndSet( ) Primitive
		C32B.4	Apply multithread programming to implement List, stack and queue using atomic primitives
C32C	Network Programming Lab	C32C.1	Develop inter process communication using pipes, message queue & shared memory
		C32C.2	Design and implement client-server applications using TCP and UDP sockets
		C32C.3	Implement peer to peer communication
		C32C.4	Analyze Network programs
C32D	Scripting Languages Lab	C32D.1	Design and test programs to solve mathematical problems
		C32D.2	Develop programs Using Ruby Script
		C32D.3	Develop Programs Using TCL Script
		C32D.4	Develop Programs Using Perl Script
C32E	Mobile Application Development Lab	C32E.1	Design Android User Interface using Layouts and components
		C32E.2	Design android applications using menus, notifications and files
		C32E.3	Develop Android application to persist data in Files, Shared Preferences and SQLite databases
		C32E.4	Develop Android application based on Alarm and URL
C32F	Software Testing Methodologies Lab	C32F.1	Examine selenium tool to perform functional testing
		C32F.2	Develop test scripts using selenium tool
		C32F.3	Apply advanced features of Selenium to automate the use cases
		C32F.4	Build test scripts on automation of web based and windows-based applications
C32G	Environmental Sciences	C32G.1	Discover knowledge regarding environment and its components.
		C32G.2	Understand the classification, importance and conservation of natural resources.
		C32G.3	Perceive the knowledge regarding different Bio -Geo classification of India.
		C32G.4	Examine impacts of pollution on the environment and their control measures.
		C32G.5	Analyze Environmental laws and Environmental Impact

Course Code	Course Name	CO No.	Course Outcomes
			Assessments.
		C32G.6	Determine sustainable development that aims to meet raising human needs.
C32H	Cyber Security	C32H.1	Analyze and evaluate the cyber security needs of an organization
		C32H.2	Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation
		C32H.3	Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
		C32H.4	Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators
		C32H.5	Design and develop a security architecture for an organization.
		C32H.6	Design operational and strategic cyber security strategies and policies.

IV Year II Sem - R16

Course Code	Course Name	CO No.	Course Outcomes
C421	Entrepreneur Resource Planning	C421.1	Make use of evolutionary development of Enterprise Resource Planning.
		C421.2	Apply ERP System options and selection methods for different projects.
		C421.3	Develop Risk Identification Analysis in Managing Projects.
		C421.4	Analyze ERP functions with respect to Sales and Marketing, Accounting and Finance and Customer Relationship Management.
		C421.5	Apply Production Module in ERP.
		C421.6	Examine the future directions of ERP.
C422	Organizational Behavior	C422.1	Analyze the behavior of individuals and groups in Organizations
		C422.2	Analyze the factors that influence Organizational behavior
		C422.3	Examine the potential effects of organizational level factors on organizational behavior.
		C422.4	Analyze potential effects of important developments in the external environment on Organizational behavior.
		C422.5	Examine the role of globalization and advances in technology on Organizational behavior.
		C422.6	Analyze organizational behavior theories, models and concepts.
C423	Information Theory & coding	C423.1	Study mathematical model of information technology and measure the information errors
		C423.2	Understand the importance of various Linear codes for communication systems
		C423.3	Interpret various cyclic codes and their shortened forms.
		C423.4	To design encoder and decoder of various codes
		C423.5	Analyze the applicability of source and channel codes

		C423.6	Discover Minimum distance and BCH bounds and procedure of decoding BCH codes
C424	Real-Time Systems	C424.1	Apply the commands for file I/O and process Control
		C424.2	Implement time management & task management in the real time operating systems
		C424.3	Analyze the communication among processes during concurrency
		C424.4	Configure different components of I/O
		C424.5	Handle Exceptions & Interrupts
		C424.6	Distinguish functionalities of various real time operating systems namely RT Linux,Vx Works,MicroC/OS-II, Tiny OS and Embedded Linux
C425	Data Analytics	C425.1	Fetch data from various sources and make it ready for analysis
		C425.2	Make use of various tools and technologies for data analysis
		C425.3	Apply regression techniques to data and evaluate performance
		C425.4	build supervised and unsupervised learning models for object segmentation
		C425.5	Build models for time series and evaluate performance
		C425.6	Visualize the data and interpret the insights exist in data
C426	Modern Software Engineering	C426.1	Explain Agile Methods
		C426.2	Analyze Extreme Programming
		C426.3	Analyze Quality assurance techniques and testing methodologies
		C426.4	Identify the approach to risk management through risk identification, risk measurement
		C426.5	List issues on modularity and coding standards
		C426.6	Develop future values of customer in various designs
C427	Advanced Algorithms	C427.1	Solve the complex problem using dynamic programming
		C427.2	Analyze complex problems using advanced data structures (stacks, queues, linked lists, graphs and trees)
		C427.3	Model real life problem using different algorithm design techniques
		C427.4	Apply different design techniques to solve network related problems .
		C427.5	Choose proper pattern matching algorithm for given problem
		C427.6	Analyze Np and NP hard problems
C428	Web Services and Service Oriented Architecture	C428.1	Analyze the Evolution of distributed computing. Core distributed computing technologies
		C428.2	Discuss the details of web service architecture
		C428.3	Identify the fundamentals of web services technologies like WSDL, UDDI and SOAP
		C428.4	Implement and deploy web service enables applications
		C428.5	Classify Discovering of Web Services and UDDI
		C428.6	Inspect Web Services Interoperability and Web Services Security
C429	Computer Forensics	C429.1	Explore digital evidences which are obtained from digital media.
		C429.2	Identify types of law enforcement.
		C429.3	Reorganization the different roles computer placed in a certain crime
		C429.4	Develop Standard procedures for Network Forensics.
		C429.5	Elaborate the Role of E-Mail in Investigation.
		C429.6	Examine NTFS Disks and Microsoft startup tasks
C42A	Neural	C42A.1	Ability to understand the concepts of Neural Networks

	Network and Deep Learning	C42A.2	Ability to select the Learning Networks in modeling real world systems
		C42A.3	Ability to understand deep learning architectures
		C42A.4	Ability to use an efficient algorithm for Deep Models
		C42A.5	Ability to use Regularizations for deep learning
		C42A.6	Ability to apply optimization strategies for large scale applications
C42B	Major Project	C42B.1	Identify problem, conduct relevant literature survey and formalize it.
		C42B.2	Analyze & design efficient, cost-effective and eco-friendly solutions using relevant tools (if necessary) and processes.
		C42B.3	Implement the design and demonstrate the functionality of developed model
		C42B.4	Evaluate the results to derive the conclusion and provide scope for future enhancement.
		C42B.5	Exhibit good interpersonal and leadership skills in meeting project deadlines with individual contribution towards progress of the project.