BVRIT HYDERABAD
College of Engineering for Women
Department of Information Technology

Course Code	Course Name	CO No.	Course Outcomes
		II Year I Semester - R18	
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 random variables
		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	Computer Organization and Microprocessor	C214.1	Demonstrate the basic components and the structure of CPU, ALU and Control Unit
		C214.2	Categorize the instruction set, instruction formats and addressing modes of 8086
		C214.3	Develop assembly language programs to solve problems.
		C214.4	Assess Computer's arithmetic & Input – Output organization
		C214.5	Demonstrate memory hierarchy and its impact on cost/performance
		C214.6	Apply instruction level parallelism and pipelining for high performance Processor design
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++
C216	Analog and Digital Electronics Lab	C216.1	Analyze the characteristics of Full wave rectifier.
		C216.2	Analyze the characteristics of different Transistor amplifier configurations.
		C216.3	Implement Boolean expressions using universal logic gates
		C216.4	Design and verify simple combinational and sequential circuits using IC s of different logic families.
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 and Microprocessor Lab	C218.1	Apply knowledge for computer assembling and software installation.
		C218.2	Estimate how to solve the trouble shooting problems.
		C218.3	Implement various operations on numbers using ALP
		C218.4	Use ALP to perform various String operations
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

		C219.4	Develop applications using Console I/O and File I/O.
C21A	Gender Sensitization 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 Semester - R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C311	Formal Languages & Automata Theory	C311.1	Design FA machines, minimization, achieve conversions among them.
		C311.2	Construct Regular expressions and Test for regular languages
		C311.3	Analyze LMD,RMD derivations and convert grammar to finite automata and vice versa
		C311.4	Design Pushdown Automata and normal forms for context free grammars.
		C311.5	Design appropriate Turing Machine for a given problem
		C311.6	Distinguish P,NP problems and PCP problems
C312	Software Engineering	C312.1	Illustrate software process framework and models for the development
		C312.2	Analyze and validate the requirement engineering strategy for develop specification document
		C312.3	Choose appropriate model to create an architectural design.
		C312.4	Apply various testing strategy to verify the software quality.
		C312.5	Illustrate the importance of framework for product metrics
		C312.6	Identify the risk strategy and QA techniques for developing quality sof Identify the risk strategy and QA techniques for developing quality sof
C313	Data Communication & Computer	C313.1	Analyze functionality of each layer is the ISO-OSI Reference Model, with suitable examples
		C313.2	Determine the pros and cons of various Transmission

	Networks		media and their usage in real time network implementation.
		C313.3	Analyze various error control, flow control, access control mechanisms for effective implementation of networking.
		C313.4	Estimate suitable routing algorithm for various network topologies and assess different addressing mechanisms
		C313.5	Assess the connection management and congestion control of TCP protocol.
		C313.6	Analyze the features and operations of various user interface protocols.
C314	Web Programming	C314.1	Design webpage using HTML,CSS, JavaScript
		C314.2	Analyze the concepts of core java in application development.
		C314.3	Develop java application in communicating with database server.
		C314.4	Develop standalone application using AWT and Applets.
		C314.5	Develop web based application using the server side technologies like servlet and JSP.
		C314.6	Analyze the purpose of XML in web services.
C315	Biometrics	C315.1	Identify the various Biometric technologies and apply the knowledge for designing biometric systems.
		C315.2	Identify pattern recognition system and its features.
		C315.3	Analyze the principles of the core biometric modalities (face, fingerprint, retina and iris), and to deploy them in authentication scenarios.
		C315.4	Examine the privacy and security concerns surrounding biometric systems.
		C315.5	Develop Watermarking techniques of biometrics.
		C315.6	Assess the need of biometric in the society and understand the research on biometric techniques.
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	Analyze 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	Analyze the image enhancement using model of spatial and frequency filtering technique
		C318.3	Demonstrate the knowledge of 2Dimensional transformation techniques.
		C318.4	Implement the image enhancement, segmentation, restoration, and compression techniques and problems.
		C318.5	Examining the Image processing algorithms by Open Source / Image Processing Tools / Matlab Software
		C318.6	Professional Contribution in the field of Digital Image Processing
C319	Principles of Programming Languages	C319.1	Identify the building blocks of various Programming languages
		C319.2	Implement various methods to describe syntax and semantics 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	Database Security	C31A.1	Evaluate various security models for large and distributed database systems
		C31A.2	Illustrate various security mechanisms for databases

		C31A.3	Relate security aspects with respect to software design and development
		C31A.4	Demonstrate database protection and intrusion detection system
		C31A.5	Compare various models for the protection of new generation database systems
		C31A.6	Apply security aspects in design of system and projects.
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 e 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	Machine Learning	C31C.1	Formulate machine learning problems corresponding to different applications
		C31C.2	Analyze Decision Tree Algorithm and Back propagation algorithms
		C31C.3	Evaluate the various error estimation and weight tuning rules.
		C31C.4	Examine Expectation Minimization and Hidden Markov Models
		C31C.5	Survey the instance based learning mechanisms.
		C31C.6	Apply genetic Learning algorithmic approach for search and optimization problem.
C31D	Pattern Recognition	C31D.1	Analyze structural pattern recognition and feature extraction techniques
		C31D.2	Classify patterns using Nearest neighbour and Naives Bayes classifier.
		C31D.3	Apply theoretical foundations of decision trees to identify best split and Bayesian classifier to label data points.
		C31D.4	Identify the state sequence and evaluate a sequence emission probability from a given HMM.
		C31D.5	Illustrate the working of classifier models like SVM, Neural Networks and identify the appropriate classifier model for typical machine learning

			applications.
		C31D.6	Illustrate and apply clustering algorithms and identify its applicability in real life problems in digit recognition
C31E	Computer Graphics	C31E.1	Analyze the functionality of various Input ,output devices
		C31E.2	Design algorithms for primitive components and to fill 2-D shapes
		C31E.3	Perform transformations and create views for 2-D co-ordinates
		C31E.4	Perform transformations and create views for 3-D co-ordinates
		C31E.5	Apply surface detection methods
		C31E.6	Build interactive computer animations
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 developi
		C31F.3	Design the software using UML diagrams
		C31F.4	Design the test case document
C31G	Computer Networks & Web Programming Lab	C31G.1	Implement various suitable protocols from Data link layer to Application layer with reference to OSI Model.
		C31G.2	Evaluate data transmission protocols and monitor the network traffic using appropriate 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 its proper use contextually.
		C31H.2	Make use of functional English effectively in formal and informal contexts.
		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	Explore different types of intellectual properties (IPs) and their roles in contributing to organizational

			competitiveness
		C31I.2	Demonstrate Crucial role of IP in organizations of different Industrial sectors for the purposes development
		C31I.3	Contrast the Crucial role of IP for the purposes Publishing, Copy Right etc.
		C31I.4	Illustration of IP in organizations of different Industrial sectors for Trade Secret, and Implementing
		C31I.5	Evaluation of IP in Industrial sectors for obtaining and maintaining Trade Mark law and International Trade Mark Law
		C31I.6	Interpretation of different levels of Infringement

IV Year I Semester - 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	Android Application Development	C412.1	Illustrate the features, components and life cycle of Android Operating system
		C412.2	Explore the UI components ,Fragments to develop android applications in event handling
		C412.3	Identify the importance of intents, broadcasts and notifications in Android applications
		C412.4	Examine various file handling techniques in android
		C412.5	Analyze the importance of database handling in Android applications
		C412.6	Make use of android features Alarms, Internet Resources and location based services to develop applications
C413	Python Programming	C413.1	Able to Read and manipulate different 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
C414	Web Scripting Languages	C414.1	Make use of resources to gain some fluency programming in Ruby, Perl, TCL and TK
		C414.2	Analyze the features of Ruby by embedding in different ways
		C414.3	Understanding the Perl by utilizing the advanced features
		C414.4	Explain syntax, variables and various features of TCL
		C414.5	Elaborate strengths and weakness TCL and select an appropriate language for solving a given problem
		C414.6	Examine the TCL and TK by embedding in different ways
C415	Ethical Hacking	C415.1	Able to gain the over view of ethical hacking
		C415.2	Gain the knowledge of the use and availability of tools to support an ethical hack
		C415.3	Gain the knowledge of interpreting the results of a controlled attack
		C415.4	Understand the role of politics, inherent and imposed limitations and metrics for planning of a test
		C415.5	Able to capture passwords using password crackers
		C415.6	Comprehend the dangers associated with penetration testing
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	Web and Database Security	C417.1	Explore the importance of cryptography & other techniques in web security
		C417.2	Analyze the techniques of privacy protecting backups and anti-theft in web security perspective
		C417.3	Identify the role of Access Control model for Database issues in Trust management &Truest Negotiation -

		C417.4	Examine Various issues in Data warehouses and OLAP System
		C417.5	Illustrate the need of security Re-engineering for Databases
		C417.6	Explore future trends in privacy & Security polices in mobile enrolment
C418	Embedded Systems	C418.1	Distinguish the embedded systems from general purpose processing systems.
		C418.2	Recommend suitable hardware for different applications of embedded systems.
		C418.3	Select different types and amount of memory based on embedded system specifications.
		C418.4	Discuss the Embedded firmware design approaches, development languages and device drivers
		C418.5	Analyze the issues and techniques of Task synchronization and communication in embedded firmware.
		C418.6	Differentiate between general purpose operating systems and RTOS.
C419	Artificial Intelligence	C419.1	Possess the ability to formulate an efficient problem space for a problem expressed in English
		C419.2	Possess the ability to select a search algorithm for a problem and characterize its time and space complexities
		C419.3	Possess the skill for representing knowledge using the appropriate technique
		C419.4	Able to apply AI techniques to solve problems of Machine learning and Natural Language Processing
		C419.5	Able to create gaming application
		C419.6	Able to create Expert system
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	Blockchain Technology	C41B.1	Interpret the working of Blockchain and cryptocurrency
		C41B.2	Examine the blockchain concepts such as Digital identity, Neutrality etc
		C41B.3	Interpret the working of Blockchain Genomics

		C41B.4	Differentiate various Tokenization concepts for public adoption
		C41B.5	Critique various technical challenges, Business models and Regulations
		C41B.6	Investigate various research advances in the area of Blockchain
C41C	Cloud Computing	C41C.1	Understand various types of computing paradigms.
		C41C.2	Identify the need for Cloud Computing and its essential characteristics.
		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	Social Network Analysis	C41D.1	Distinguish between current web and Semantic web
		C41D.2	Make use of Ontology for social network description and Analysis
		C41D.3	Mine communities from social networks and archives
		C41D.4	Analyze the human behavior from social network data
		C41D.5	Examine trust and privacy policies in social network usage
		C41D.6	Utilize various tools for visualizing social networks
C41E	Information Retrieval Systems	C41E.1	Compute the similarity measure between collections of documents using different approaches
		C41E.2	Apply various retrieval techniques to improve the efficiency
		C41E.3	Compute the similarity coefficient for retrieval of relevant documents of cross language in nature
		C41E.4	Apply optimization techniques to improve the efficiency of information retrieval
		C41E.5	Perform information retrieval from various distributed sources in different forms
		C41E.6	Build the working model of information retrieval system
C41F	Android Application Development Lab	C41F.1	Design android applications using layouts and controls
		C41F.2	Design android applications using menus, notifications and files
		C41F.3	Develop user interface applications in Android
		C41F.4	Develop URL related applications in Android
C41G	Python Programming Lab	C41G.1	ability to play with the basic concepts of python scripting language
		C41G.2	ability to manipulate Lists, Tuples, Sets and dictionaries
		C41G.3	ability to import built in libraries & Create libraries

		C41G.4	Ability to create practical & contemporary application such as web application and data analysis
C41H	Web Scripting Languages Lab	C41H.1	Design and test programs to solve mathematical problems
		C41H.2	Develop programs Using Ruby Script
		C41H.3	Develop Programs Using TCL Script
		C41H.4	Develop Programs Using Perl Script
C41I	Ethical Hacking Lab	C41I.1	Gain the knowledge of the use and availability of tools to support an ethical hack
		C41I.2	Gain the knowledge of interpreting the results of a controlled attack
		C41I.3	Able to capture web based passwords
		C41I.4	Able to create penetration testing
C41J	Internet of Things Lab	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
		C41J.4	Elaborate the need for hardware and web application use in an IoT implementation.
C41K	Industry Oriented Mini Project	C41K.1	Utilize acquired knowledge within the chosen area of technology for project development
		C41K.2	Justify the technical aspects of the chosen project with a comprehensive and systematic approach
		C41K.3	Develop engineering projects using technical aspects
		C41K.4	Construct the report of project related activities effectively to peers and mentors
C41L	Seminar	C41L.1	Identify emerging topic specific to the programme.
		C41L.2	Extract the information relevant to the chosen topic.
		C41L.3	Deliver the knowledge using multimedia.
		C41L.4	Answer the queries with appropriate explanation and elaboration.
		C41L.5	Compile an effective technical report, providing conclusions and proposing an appropriate future scope.

			II Year II Semester - 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 & 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 various Memory management techniques
		C223.6	Explore file system interface & 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.
C228	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 Semester - R18			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C321	Introduction to Embedded Systems	C321.1	Distinguish the embedded systems from general purpose processing systems.
		C321.2	Recommend suitable hardware for different applications of embedded systems.
		C321.3	Select different types and amount of memory based on embedded system specifications.
		C321.4	Discuss the Embedded firmware design approaches, development languages and device drivers
		C321.5	Analyze the issues and techniques of Task synchronization and communication in embedded firmware.
		C321.6	Differentiate between general purpose operating systems and RTOS.
C322	Principles of Compiler Construction	C322.1	Identify the phases in design of a compiler
		C322.2	Apply practical aspects of automata theory
		C322.3	Distinguish between top-down parsers and bottom-up parsers.
		C322.4	Construct Intermediate Code based on Abstract Tree and Symbol table data.
		C322.5	Decide among the code optimizati7on techniques to use.
		C322.6	Build powerful code generating compilers.
C323	Algorithm Design and Analysis	C323.1	Analyze the performance of algorithms and represent using relevant notations.
		C323.2	Model various engineering problems using graphs and trees.
		C323.3	Apply suitable paradigm to design efficient algorithms for wide-range of problems.
		C323.4	Reduce the search space of a problem using bounding functions.
		C323.5	Choose an appropriate data structure for the design.
		C323.6	Identify P, NP, NP-Hard and NP-Complete problems to apply suitable techniques.

C324	Internet of Things	C324.1	Inference the impact and challenges posed by IoT networks leading to new architectural models.
		C324.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
		C324.3	Appraise the role of IoT protocols for efficient network communication.
		C324.4	Elaborate python programming with various interfacing devices using with Raspberry PI.
		C324.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry
		C324.6	Construct a restful web API.
C325	Ethical Hacking	C325.1	Able to gain the over view of ethical hacking
		C325.2	Gain the knowledge of the use and availability of tools to support an ethical hack
		C325.3	Gain the knowledge of interpreting the results of a controlled attack
		C325.4	Understand the role of politics, inherent and imposed limitations and metrics for planning of a test
		C325.5	Able to capture passwords using password crackers
		C325.6	Comprehend the dangers associated with penetration testing
C326	Network Programming	C326.1	Examine major protocols used for inter process communication
		C326.2	Analyzing Client server communication, Elementary UDP Sockets programming, I/o multiplexing
		C326.3	Apply the concepts related to Interprocess communication using sockets.
		C326.4	Explain network services that communicate through Internet
		C326.5	Access various kinds of Broadcasting and Multicasting mechanisms.
		C326.6	Design robust socket-based applications
C327	Scripting Languages	C327.1	Make use of resources to gain some fluency programming in Ruby, Perl, TCL and TK
		C327.2	Analyze the features of Ruby by embedding in different ways
		C327.3	Understanding the Perl by utilizing the advanced features
		C327.4	Explain syntax, variables and various features of TCL
		C327.5	Elaborate strengths and weakness TCL and select an appropriate language for solving a given problem
		C327.6	Examine the TK by embedding in different ways

C328	Mobile Application Development	C328.1	Analyze the features, components and life cycle of Android Operating system
		C328.2	Design Android application with UI components, Fragments and event handling
		C328.3	Identify the importance of intents in Android applications development
		C328.4	Develop Android applications using broadcasts and notifications
		C328.5	Examine the data persistence mechanism using Files and Shared Preferences
		C328.6	Develop Android application to perform operations with SQLite database
C329	Software Testing Methodologies	C329.1	Analyze the basic concepts of software testing and its essentials and Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
		C329.2	Apply functional testing using control flow and transaction flow graphs.
		C329.3	Test for a domain or an application and identifying the nice and ugly domains.
		C329.4	Choose appropriate path expression, KV charts, specifications and more testing strategies.
		C329.5	Design and implement state graph, state testing, good state graph, bad state graph and their testability tips.
		C329.6	Explain graph matrices, matrix properties and node reduction algorithm.
C32A	Renewable Energy Sources	C32A.1	Assess the energy economics for conventional and renewable energy sources
		C32A.2	Understand the principles of wind,solar photovoltaic and fuel cells power generation
		C32A.3	Illustrate working principle and characteristics of Induction Generator
		C32A.4	Analyze various energy storage systems
		C32A.5	Understand the integration and interconnection of alternative energy sources with the grid
		C32A.6	Analyze the issues involved in the integration of non renewable energy sources to the grid
C32B	Embedded Systems & Internet of Things Lab	C32B.1	Exploring the Functional testing of devices and Exporting Display on to other systems
		C32B.2	Evaluate the interface of I/O devices and GPIO programming
		C32B.3	Make use of IOT components to Evaluate the functionality of Voltage indicator, Game simulation and Display interfaces
		C32B.4	Examining the functionality of tools used for porting, website hosting and FM transmission

C32C	Compiler Construction Lab	C32C.1	Identify the practical approach of how a compiler works
		C32C.2	Construct top down and bottom up parse tools
		C32C.3	Construct LEX and YACC programs
		C32C.4	Develop new computer languages
C32D	Ethical Hacking Lab	C32D.1	Gain the knowledge of the use and availability of tools to support an ethical hack
		C32D.2	Gain the knowledge of interpreting the results of a controlled attack
		C32D.3	Able to capture web based passwords
		C32D.4	Able to create penetration testing
C32E	Network Programming Lab	C32E.1	Develop inter process communication using pipes, message queue & shared memory
		C32E.2	Design and implement client-server applications using TCP and UDP sockets
		C32E.3	Implement peer to peer communication
		C32E.4	Analyze Network programs
C32F	Scripting Languages Lab	C32F.1	Understanding the Ruby by utilizing the advanced features
		C32F.2	Understanding the Perl by utilizing the advanced features
		C32F.3	Understanding the TCL by utilizing the advanced features
		C32F.4	Elaborate strengths and weakness TCL and select an appropriate language for solving a given problem
C32G	Mobile Application Development Lab	C32G.1	Design Android User Interface using Layouts and components
		C32G.2	Design android applications using menus, notifications and files
		C32G.3	Develop Android application to persist data in Files, Shared Preferences and SQLite databases
		C32G.4	Develop Android application based on Alarm and URL
C32H	Software Testing Methodologies Lab	C32H.1	Examine selenium tool to perform functional testing
		C32H.2	Demonstrate how to execute test scripts using selenium
		C32H.3	Apply advanced features of Selenium to automate the use cases
		C32H.4	Build test scripts on automation of web based and windows-based applications
C32I	Environmental Science	C32I.1	Discover knowledge regarding environment and its components.
		C32I.2	Understand the classification, importance and conservation of natural resources.
		C32I.3	Perceive the knowledge regarding different Bio -Geo classification of India.
		C32I.4	Examine impacts of pollution on the environment and their control measures.

| | | C32I.5 | Analyze Environmental laws and Environmental Impact Assessments. |
| | | C32I.6 | Determine sustainable development that aims to meet raising human needs. |

IV Year II Semester -R16			
Course Code	**Course Name**	**CO No.**	**Course Outcomes**
C421	Organizational Behavior	C421.1	Analyze the behavior of individuals and groups in Organizations
		C421.2	Analyze the factors that influence Organizational behavior
		C421.3	Examine the potential effects of organizational level factors on organizational behavior.
		C421.4	Analyze potential effects of important developments in the external environment on Organizational behavior.
		C421.5	Examine the role of globalization and advances in technology on Organizational behavior.
		C421.6	Analyze organizational behavior theories, models and concepts.
C422	Steganography and Watermarking	C422.1	Analyze History, Applications and properties of watermarking and steganography.
		C422.2	Demonstrate Models and algorithms of watermarking
		C422.3	Analyze errors in watermarking
		C422.4	Evaluate perceptual models and its examples.
		C422.5	Identify Attacks and its solutions through Authentication techniques and watermarking.
		C422.6	Identify theoretic foundations of steganography and steganalysis
C423	Real-Time Systems	C423.1	Apply the commands for file I/O and process Control
		C423.2	Implement time management & task management in the real time operating systems
		C423.3	Analyze the communication among processes during concurrency
		C423.4	Configure different components of I/O
		C423.5	Handle Exceptions & Interrupts
		C423.6	Distinguish functionalities of various real time operating systems namely RT Linux,Vx Works,MicroC/OS-II, Tiny OS and Embedded Linux

C424	Data Analytics	C424.1	Fetch data from various sources and make it ready for analysis
		C424.2	Make use of various tools and technologies for data analysis
		C424.3	Apply regression techniques to data and evaluate performance
		C424.4	build supervised and unsupervised learning models for object segmentation
		C424.5	Build models for time series and evaluate performance
		C424.6	Visualize the data and interpret the insights exist in data
C425	Modern Software Engineering	C425.1	Explain Agile Methods
		C425.2	Analyze Extreme Programming
		C425.3	Analyze Quality assurance techniques and testing methodologies
		C425.4	Identify the approach to risk management through risk identification, risk measurement
		C425.5	List issues on modularity and coding standards
		C425.6	Develop future values of customer in various designs
C426	Intrusion Detection System	C426.1	Examine Various threats against computes and networked system
		C426.2	Explore various classes of attacks in network layer
		C426.3	Identify various solutions for the problem Intrusion deletion system
		C426.4	Make use of Anomaly directors and algorithms for intrusion detection
		C426.5	Examine various techniques like malware detection-obfuscation foe attack trees and correction of alerts
		C426.6	Utilize different techniques to resolve email security issues
C427	ADHOC and Sensor Networks	C427.1	Identify the importance of MANETS in ASN
		C427.2	Explore Routing & forwarding strategies in ASN
		C427.3	Compare various data transmission techniques like Broadcasting &multicasting
		C427.4	Analyze the role of Geo casting in ASN
		C427.5	Illustrate the applications of wireless sensors
		C427.6	Examine various Lower layer Issues and Higher layer issues of wireless sensor networks
C428	Neural Networks and Deep Learning	C428.1	Ability to understand the concepts of Neural Networks
		C428.2	Ability to select the Learning Networks in modeling real world systems
		C428.3	Ability to understand deep learning architectures
		C428.4	Ability to use an efficient algorithm for Deep Models
		C428.5	Ability to use Regularizations for deep learning
		C428.6	Ability to apply optimization strategies for large scale applications

C429	Human Computer Interaction	C429.1	Elaborate the design of good Interface and features of GUI
		C429.2	Compare the Human interaction speed with computers
		C429.3	Apply visually pleasing composition of elements on screen design
		C429.4	Identify Various Navigation Schemes, Screen based controls in user interface design
		C429.5	Apply the multimedia features to Components
		C429.6	choose various User Interface building tools and Interaction Devices
C42A	Major Project	C42A.1	Identify the problem, conduct relevant literature survey and formalize it.
		C42A.2	Analyze & design efficient, cost-effective and eco-friendly solutions using relevant tools (if necessary) and processes.
		C42A.3	Implement the design and demonstrate the functionality of developed model
		C42A.4	Evaluate the results to derive the conclusion and provide scope for future enhancement.
		C42A.5	Exhibit good interpersonal and leadership skills in meeting project deadlines with individual contribution towards progress of the project.