DEPARTMENT OF CSE (DATA SCIENCE)

COURSE OUTCOMES FOR R20 REGULATION

II-YEAR

20CS301PC: Design &Analysis Algorithms

1. Analyze the algorithms in terms of space and time.
2. Design the algorithm using divide and conquer and greedy approach.
3. Apply dynamic programming strategy to problems.
4. Apply back tracking technique and branch and bound to problems.
5. Construct the algorithm using non deterministic approaches.

20CS302PC: Data Structures using C

1. Explore the basic concepts of data structures.
2. Summarize the concepts of dictionary and hash table.
3. Implement searching in various trees.
4. Apply different sorting techniques on data.
5. Design pattern matching algorithm for a problem.

20CS303PC: OOPS Through Java

1. Solve real world problems using OOP techniques.
2. Apply the packages and interfaces, streams in programs.
3. Develop exceptions, multithreaded applications with synchronization.
4. Develop the application using collection framework.
5. Design GUI based applications using applets and swings.

20CS304PC: Theory of Computation

1. Summarize the concepts of abstract machines and their languages.
2. Design the finite state machines from regular expressions.
3. Design context free grammar for formal languages.
4. Apply normalization to the context free grammar.
5. Distinguish between decidability and un-decidability problems.

20CS305PC: Programming with Python

1. Examine python syntax, semantics and flow control.
2. Demonstrate proficiency in handling strings and arrays.
3. Develop python programs using core data structures.
4. Conduct experiments on file handling, exception handling and modules.

5. Interpret the concepts of object oriented programming in python.

20CS306PC: Data Structure using C Lab

1. Develop C programs for basic data structures.
2. Implement sorting and searching algorithms.

20CS307PC: Python Lab

1. Implement programs using basic data structures.
2. Develop programs using modules, files and object oriented concepts.

20CS308PC: OOPS Through Java Lab

1. Develop java programs for solving real world problems using collection framework.
2. Design Graphical User Interfaces using applets and swing controls.

20MC309CI: Constitution of India

1. Understand the emergence and evolution of Indian Constitution.
2. Understand the structure and composition of indian Constitution.
3. Analyze federalism in the indian context.
4. Understand the Indian Political scenario amidst the emerging challenges.
5. Evaluate indian foreign relations under cold war and post-cold war.

20CS401PC: Database Management Systems

1. Design a database conceptually using ER Diagrams.
2. Design a database using Relational Model.
3. Make use of SQL for managing databases.
4. Summarize different transaction processing and Concurrency control mechanisms.
5. Compare different file organization methods.

20EC402PC: Analog and Digital Electronics

1. Understand the utilization of components.
2. Analyze small signal amplifier circuits.
3. Learn postulates of Boolean algebra to the digital circuit functions.

4. Design and analyze combinational circuits.
5. Know about the sequential circuits.

20MA403BS: Computer Oriented Statistical Methods

1. Understand the theory of probability.
2. Apply test of hypothesis and sampling techniques.
3. Apply the test of hypothesis for samples.
4. Find roots of Algebraic and transcendental Equations.
5. Compute solutions for ordinary differential equations.

20CS404PC: Operating Systems

1. Illustrate the operating system concepts.
2. Compare different CPU Scheduling Algorithms.
3. Summarize process management and synchronization mechanisms.
4. Explore different memory management techniques.
5. Design file system interface and operations.

20CS405PC: Computer Organization

1. Distinguish computer Organization and Computer Architecture.
2. Summarize the basics of instruction sets and their functionality.
3. Evaluate different arithmetic operations.
4. Demonstrate the functional units of the computer.
5. Design a pipeline for consistent execution of instructions.

20CS406PC: OS Lab (Using UNIX/LINUX)

1. Implement Linux System calls using C.
2. Simulate basic operating system concepts like scheduling, memory management.

20CS407PC: DBMS Lab

1. Design a database using SQL.
2. Implement procedures, cursors and triggers in SQL.

20EC408PC: Analog and Digital Electronics Lab

1. Simulate Boolean algebra and digital circuit functions.
2. Analyze combinational and Sequential circuits.

20MC409GS: Gender Sensitization Lab

1. Men and women students and professionals will be better equipped to work and live together as equals.
2. Through providing accounts of studies and movements as well as the new laws that provide protection and relief to wen, the empower students to understand and respond to gender violence.

III-YEAR

20CS501PC: DATA MINING

1. Understand the types of data to be mined and primitives of the data mining system.
2. Extract interesting patterns from large amounts of data.
3. Discover the classification of data mining in various fields.
4. Employ suitable data mining algorithms to clustering applications.
5. Evaluate the accuracy of supervised and unsupervised models and algorithms.

20CS502PC: COMPUTER NETWORKS

1. Gain the knowledge of the basic computer network technology.
2. To know the functionalities of each layer in the OSI and TCP/IP reference model.
3. Implementation of sub netting and routing mechanisms.
4. Describe the essential transport protocols.
5. Understanding the applications of computer networks.

20CS503PC: WEB TECHNOLOGIES

1. Apply server-side scripting with PHP language.
2. Understand XML and how to parse and use XML Data with Java.
3. To introduce Server-side programming with Java Servlets.
4. Implement JSP pages using Cookies and Session tracking.
5. Design client-side scripting, validation of forms and AJAX programming.

20CS511PE: DISTRIBUTED SYSTEMS (Professional Elective – I)

1. Enumerate the basic concepts of distributed systems.
2. Illustrate the need of operating system support for distributed systems.
3. Summarize the different techniques of Transactions and Concurrency control.
4. Ability to design distributed systems for basic level applications.
5. Design distributed shared memory.

20CS512PE: OBJECT ORIENTED ANALYSIS AND DESIGN (PROFESSIONAL ELECTIVE – I)

1. The importance of modelling in UML.
2. Compare and contrast the object-oriented model with the E-R and EER models.
3. Design use case diagram.

4. Design an application using deployment diagram.
5. Apply UML diagrams to build library application.

20CS513PE: DATA ANALYTICS (Professional Elective - I)

1. Understand various Data Sources and Pre-processing mechanisms.
2. Depict data analysis/statistical analysis.
3. Design Data Architecture.
4. Understand the impact of data analytics for business decisions and strategy.
5. Design standard data visualization and formal inference procedures.

20CS514PE: IMAGE PROCESSING (Professional Elective - I)

1. Understand the basic concepts of Image processing.
2. Design image enhancement mechanisms.
3. Apply image restoration models.
4. Implement image segmentation methods.
5. Design image compression techniques.

20CS515PE: PRINCIPLES OF PROGRAMMING LANGUAGES
(Professional Elective - I)

1. Understanding the syntax and semantics of a formal language.
2. Apply a suitable programming paradigm for a given computing application.
3. Introducing the functional programming.
4. Exploring the concepts of concurrency model.
5. Compare and contrast the features of programming languages.

20CS521PE: COMPUTER GRAPHICS (Professional Elective - II)

1. To know the mathematics of computer graphics.
2. Design geometrical transformations and viewing functions.
3. Construct 3D object representation using surfaces.
4. Apply the geometric projections for 3D objects.
5. Design an animation using surface detection mechanisms.

20CS522PE: ADVANCED OPERATING SYSTEMS
(Professional Elective - II)

1. Design approaches of advanced operating systems.
2. Formulate the approaches of Distributed operating systems.

3. Design the dead lock detection algorithms.
4. Design multi-processor operating systems.
5. Identify the requirements Distributed File System, scheduling, and Distributed Shared Memory.

20CS523PE: INFORMATION RETRIEVAL SYSTEMS

(Professional Elective - II)

1. Understand IR principles large collections of data.
2. Design the data model using statistical approaches.
3. Apply automatic document clustering on IR.
4. Design an Information Retrieval System for web search tasks.
5. Apply visualization tools for multimedia information retrieval.

20CS524PE: DISTRIBUTED DATABASES (Professional Elective - II)

1. Understand the aspects of distributed database systems.
2. Interpret query processing and optimization in distributed databases.
3. Summarize the transaction management process.
4. Know about parallel databases and reliability.
5. Understand the design aspects of the object-oriented database systems.

20CS525PE: NATURAL LANGUAGE PROCESSING

(Professional Elective - II)

1. Summarize the NLP structure documents.
2. Use of proper experimental methodology for evaluating NLP systems.
3. Construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.
4. Implement NLP algorithms.
5. Design different language modelling Techniques.

20CS504PC: DATA MINING LAB

1. Apply classification mining algorithms as a component to the existing tools.
2. Apply clustering mining techniques for realistic data.

20CS505PC: COMPUTER NETWORKS AND WEB TECHNOLOGIES LAB

1. Implement data link layer farming methods.
2. Implement routing and congestion issues in network design.
3. Implement PHP concepts in HTML.
4. Implement server-side scripting using XML.

20DS506PC: R PROGRAMMING LAB

1. Implement basic concepts of R programming that includes conditional, looping, lists, Strings, Functions, Frames, Arrays, and File programming.
2. Implement the concepts of R Script to extract the data from data frames and file operations.
3. Apply descriptive statistics on different datasets.
4. Make Use of R Graphics and Tables to visualize results of various statistical operations on data.

20MC507IP: INTELLECTUAL PROPERTY RIGHTS

1. Interpret the trade marks, copy rights, patents and agencies.
2. Use of rules and properties of IPR for grants.

20DS601PC: DATA SCIENCE (PROFESSIONAL ELECTIVE - IV)

1. Apply principles of NumPy and Pandas to the analysis of data.
2. Make use of various file formats in loading and storage of data.
3. Identify and apply the need and importance of pre-processing techniques.
4. Apply various techniques to improve data usability for the end system.
5. Show the results and present them in a pictorial format.

20CS602PC: COMPILER DESIGN

1. Compute tokens and regular expressions for lexical analysis.
2. Implement top-down and bottom-up parsers.
3. Construct intermediate code for procedures.
4. Optimize the code generation.
5. Analyze the data flow.

20CS603PC: SOFTWARE ENGINEERING

1. Ability to translate end-user requirements into the system.
2. Identify and apply the process model based on software requirements.
3. Ability to build the design of a systematic models.
4. Construct testing strategies and generate a report.
5. Quantify the metrics for process and products.

20CS631PE: BIG DATA ANALYTICS (Professional Elective - III)

1. Describing Big Data and its usage.
2. Learn the approaches of big data analytics.
3. Implementation of Map-Reduce framework.
4. Apply the NoSQL databases using the HBase framework.
5. Approaches to implementing text analytics.

20CS632PE: NETWORK PROGRAMMING (Professional Elective - III)

1. Introducing the concepts of network programming.
2. Write socket API based programs.
3. Design and implement client-server applications using TCP and UDP sockets.
4. Analyze network programs by broadcasting and multicasting.
5. Understand the raw sockets and remote login approaches.

20CS633PE: SCRIPTING LANGUAGES (Professional Elective - III)

1. Comprehend the SOAP architecture and web services.
2. Understand the Ruby scripting language.
3. Apply the basic Perl programming language.
4. Implement the advanced programming in PERL.
5. Apply TCL programming.

20CS634PE: MOBILE APPLICATION DEVELOPMENT (Professional Elective - III)

1. Understand the working of Android OS.
2. Apply the concepts of mobile applications on Android.
3. Develop Android user interfaces.
4. Deploy and maintain the Android Applications.
5. Debug programs running on mobile devices.

20CS635PE: SOFTWARE TESTING METHODOLOGIES (Professional Elective - III)

1. Design the best test strategy in accordance with the development model.
2. Apply transaction-flow and domain path testing strategies.
3. Illustrate the logic-based testing method.
4. Apply the network-flow testing for the application.
5. Develop automated testing using the Jmeter or WinRunner tools.

20DS604PC: DATA SCIENCE LAB

1. Perform various operations on NumPy arrays.
2. Importing data from different file formats using pandas.
3. Draw different types of charts using matplotlib.

20EN605HS: ADVANCED COMMUNICATION SKILLS LAB

1. Interpret the vocabulary to improve the fluency in English.
2. Illustrate the ideas to use of communication skills.

20CS631PE: BIG DATA ANALYTICS LAB (Professional Elective - III)

1. Understand the installation of VMWare, Hadoop and LINUX Operating System.
2. Apply Map Reduce program that mines weather data and other applications.

20CS632PE: NETWORK PROGRAMMING LAB
(Professional Elective - III)

1. Implement client-server applications using TCP and UDP sockets.
2. Analyze network programs.

20CS633PE: SCRIPTING LANGUAGES LAB (Professional Elective - III)

1. Understand the differences between Scripting languages and programming languages.
2. Apply the programming in Ruby, Perl, TCL.

20CS634PE: MOBILE APPLICATION DEVELOPMENT LAB

(Professional Elective - III)

1. Develop user interfaces on Android platform.
2. Deploy and maintain the Android Applications.

20CS635PE: SOFTWARE TESTING METHODOLOGIES LAB

(Professional Elective - III)

1. Develop the best test strategies in accordance to the development model.
2. Apply the test cases on test automation tools.

IV-YEAR

20MB701PC: BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

1. Understand the various Forms of Business and the impact of economic variables on the Business.
2. Comprehend the demand and supply analysis.
3. Explore the usage of marketing and pricing of a product.
4. Maintaining the financial accounts of a firm or company.
5. Monitoring the accounts through ratios.

20CS702PC: MACHINE LEARNING

1. Understand the concept of computational intelligence.
2. Description of artificial neural networks and their usage.
3. Implement basic machine learning algorithms.
4. Implement instant based learning by set rules.
5. Introduces analysis by reinforcement learning algorithms.

20CS741PE: CLOUD COMPUTING (Professional Elective - IV)

1. Ability to understand the cloud computing paradigms.
2. Understand various service delivery models of a cloud computing architecture.
3. Identify the cloud infrastructure management and migration tools.
4. Understand the cloud service ways in which the cloud can be programmed.
5. Understanding cloud service providers.

20CS742PE: SOFT COMPUTING (Professional Elective - IV)

1. Understand the concepts of soft computing.
2. Introduce fuzzy logic and reasoning.
3. Apply Particle Swarm optimization algorithms.
4. Perform genetic algorithms for classification.
5. Comprehend Soft computing techniques.

20CS743PE: MOBILE COMPUTING (PROFESSIONAL ELECTIVE - IV)

1. Explore the knowledge of mobile communication and GSM protocols.
2. Describe the mobile network MAC layer protocols.
3. Use of protocols TCP and IP in the mobile transport layer.
4. Design data dissemination and synchronization.
5. Develop ad-hoc network applications and/or algorithms/protocols.

20AI744PE: ARTIFICIAL INTELLIGENCE (PC)

1. Formulate an efficient problem space for a problem expressed in natural language.
2. Select a search algorithm for a problem and estimate its time and space complexities.
3. Representing knowledge using the appropriate technique for a given problem.
4. Apply AI techniques to solve problems of game playing and machine learning.
5. Act on uncertain problem solving.

20AI745PE: SOCIAL NETWORK ANALYSIS
(PROFESSIONAL ELECTIVE - IV)

1. Compare different centrality measures in social networks.
2. Analyze different community detection algorithms.
3. Analyze various link prediction models.
4. Summarize the concepts of Social influence analysis.
5. Apply opinion mining and sentimental analysis techniques for real world problems.

20CS751PE: DEEP LEARNING (Professional Elective - V)

1. Understand the concepts of Neural Networks
2. Select the Learning Networks in modeling real-world systems
3. Apply optimization strategies for large scale applications
4. Use an efficient algorithm for Deep Models
5. Implement Deep learning models in various domains.

20CS752PE: INTERNET OF THINGS (Professional Elective - V)

1. Understand the role of politics, inherent and imposed limitations and metrics for theplanning of a test.
2. Comprehend the dangers associated with penetration testing.
3. The use and availability of tools to support an ethical hack.
4. The knowledge of interpreting the results of a controlled attack.
5. Generation of test results and management of documents.

20CS753PE: SOFTWARE PROCESS & PROJECT MANAGEMENT
(Professional Elective - V)

1. Gain knowledge of software requirements, economics and CMM.
2. Develop the life cycle of software development, project organization.
3. Design project structural plan and scheduling cost.
4. Gain the project process management skills.

5. Develop software product using conventional and modern principles of software project management

20CS754PE: DESIGN PATTERNS (PROFESSIONAL ELECTIVE - V)

1. Design Patterns in handling common problems faced during building an application.
2. Designing of structure of document editor.
3. Designing the documental pattern.
4. Designing the structural patter for document handling.
5. Strategize the behavioural pattern.

20CS755PE: ADVANCED ALGORITHMS (Professional Elective - V)

1. Choose appropriate data structures and algorithm design methods for a specified application.
2. Describe the graph algorithms.
3. Apply the sorting networks.
4. Design the string-matching algorithms.
5. Understand non-linear programming.

20CS703PC: MACHINE LEARNING LAB

1. Performing experiments in Machine Learning using real-world data.
2. Apply the modern notions in data analysis-oriented computing.

20MB801PC: ORGANIZATIONAL BEHAVIOUR

1. Introducing environmental and organizational behavior.
2. Describing the personality and process attributes at a cognitive level.
3. Usage of decision making at individual and team levels.
4. Comprehend power and politics.
5. Analyzing the leading performance.

20CS861PE: HUMAN COMPUTER INTERACTION (Professional Elective - VI)

1. Apply HCI and principles to interaction design.
2. Design process of human-computer interaction.
3. Design principles of GUI.
4. Design certain tools for blind or PH people.
5. Applications of virtual and augmented reality interfaces.

20CS862PE: CYBER FORENSICS (Professional Elective - VI)

1. Describe the crime types and incident response procedures.
2. Understand the usage of computers in forensic laboratories.
3. Explore the data analysis and visualization techniques.
4. Use various forensic tools for a wide variety of investigations.
5. Design principles of data management methods.

20AI863PE: COMPUTER VISION (Professional Elective - VI)

1. Enumerate the fundamentals of computer vision.
2. Apply different feature detection and matching techniques for a real world problem.
3. Apply Image Segmentation Techniques on an image.
4. Summarize the applications of Feature based alignment.
5. Compare different recognition techniques.

20CS864PE: CRYPTOGRAPHY AND NETWORK SECURITY (Professional Elective - VI)

1. Understand the key concepts of cryptography and security.
2. Comprehend the private and public key cryptographic algorithms.
3. Defining the key distribution and management methods.
4. Use of transporting data by Web security and Firewalls protocols.
5. Distribute the PGP to send a secured e-mail message.

20DS865PE: NOSQL DATABASES (Professional Elective - VI)

1. Understand about Database Management System.
2. Understand the concept of NoSQL using MongoDB.
3. Analyze various Query features on NoSQL.
4. Understand and examine the relationship among data and its operations using MongoDB.
5. Develop Web applications with NoSQL and its administration.