COURSE OUTCOMES FOR B.TECH-CSE R20 FOR THE YEAR 2020-2021

Course Outcome	Year/Semester I Sem	Subject Name (Subject Code) LINEAR ALGEBRA AND CALCULUS (B20MA01)	No. of Hours L:3 T:1 P:0	Credits: 4
On successful completion of this course, students will be able to:				
1	Understand the principles of matrix to calculate the characteristics of system of linear equations using multiple methods.			
2	Determine Eigen values, Eigenvectors of matrices.			
3	Analyse the nature of sequence and series to identify the convergence.			
4	Evaluate limits of single-variable functions graphically and computationally. Analyse improper integrals using Beta and Gamma functions.			
5	Calculate Partial derivatives, extreme of functions of multiple variables.			
Course Outcome	**Year /Semester I Sem**	**Subject Name (Subject Code)** MODERN PHYSICS (B20PH01)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
On successful completion of this course, students are able to:				
1	Understands the basic concepts and hypothesis of quantum mechanics			
2	Describes the characteristics and working of lasers and their use in various fields.			
3	Analyze and apply the concepts of wave optics for accurate determination of theinterference in thin films, Newton's rings and the diffraction in single slit etc.			
4	Classify the materials on the basis of energy band gap, and evaluates the carrierconcentration of given semiconductors for device applications			
5	Apply the concepts of the light propagation in optical fibres in opticalcommunication systems			
Course Outcome	**Year / semester I Sem**	**Subject Name (Subject Code)** BASIC ELECTRICAL AND ELECTRONICS ENGINEERING(B20EE01)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Analyze circuit theorems, mesh and nodal analysis, series and parallel networks, Electricalpower.			
2	Gain knowledge on AC circuits, reactance, Impedance, Susceptance and Admittance andPower Factor			
3	Learn the working principle of DC motors, Transformers			
4	Study the characteristics of PN Junction diode and zener diode			
5	Learn the basic of Amplifiers and Rectifiers.			
Course Outcome	**Year / semester I Sem**	**Subject Name (Subject Code)** PROGRAMMING FOR PROBLEM SOLVING(B20CS01)	**No. of Hours L:4 T:0 P:0**	**Credits: 4**
After the completion of this course, the students should be able to				
1	Understanding how problems are posed and how they can be analyzed for obtainingsolutions.			
2	Learning of sequencing, branching, looping and decision making statements tosolve scientific and engineering problems.			
3	Implementing different operations on arrays and creating and using of functionsto solve problems			
4	Understanding and exploring the various methods of memory allocations.			
5	Ability to design and implement different types of file structures using standardmethodology.			

Course Outcome	Year / semester I Sem	Subject Name (Subject Code) ENGINEERING DRAWING (B20ME01)	No. of Hours L:0 T:0 P:4	Credits: 2
After the completion of this course, the students should be able to				
1	Understand various commands, modify the applications and object properties in AUTOCAD			
2	Analyse the Projections of Points and solids			
3	Estimate the use of drawings, dimensioning, scales and conic sections			
4	Compare the Conversion of Isometric views to Orthographic view			

Course Outcome	Year / semester I Sem	Subject Name (Subject Code) PHYSICS LAB (B20PH05)	No. of Hours L:0 T:0 P:3	Credits: 1.5
After the completion of this course, the students should be able to				
1	Estimate the frequency of tuning for and AC supply with the help of stretched strings			
2	Analyze as well as compare the intensity distribution of interference and diffraction patterns			
3	Draw the characteristics of electrical and electronic circuits and evaluate the dependent parameter			
4	Explore and understand the applications of semiconducting devices			
5	Evaluates the wavelength and radius of curvature of Plano convex lens by Newton's rings			

Course Outcome	Year / semester I Sem	Subject Name (Subject Code) PROGRAMMING FOR PROBLEM SOLVING LAB(B20CS02)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Understand basic structure of the C Programming, data types, declaration and usage ofvariables, control structures and all related concepts.			
2	Ability to understand any algorithm and Write the C programming code in executable form			
3	Implement Programs using functions, pointers and arrays, and use the pre-processors to solvereal time problems			
4	Ability to use file structures and implement programs on files.			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS(B20MA02)	No. of Hours L:3 T:1 P:0	Credits: 4
After the completion of this course, the students should be able to				
1	Apply the fundamental concepts of ordinary differential equations to real time problems			
2	Find the complete solution of a non homogeneous differential equations and applying its concepts inEngineering problems			
3	Evaluate the multiple integrals in various coordinate systems.			
4	Apply the concepts of gradient, divergence and curl to formulate Engineering problem			
5	Analyse line, surface and volume integrals using fundamental theorems.			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) MODERN CHEMISTRY (B20CH04)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	The knowledge of electro chemical cells, different batteries			
2	The knowledge of principles and concepts in corrosion & it's control methods.			
3	The knowledge of Water treatment.			
4	The knowledge of Amino acids, Proteins and Nucleic acids			
5	The knowledge of principles and concepts in Forensic drug chemistry and it's analysis.			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) DATA STRUCTURES AND ALGORITHMS(B20CS04)	No. of Hours L:4 T:0 P:0	Credits: 4
After the completion of this course, the students should be able to				
1	Define the basic techniques of algorithm analysis			
2	Examine the linear and non linear data structures.			
3	Develop Priority Queues and Balanced Trees			
4	Understand Hashing Techniques and Graph applications			
5	Apply suitable algorithms for sorting Technique			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) PYTHON PROGRAMMING(B20CS03)	No. of Hours L:4 T:0 P:0	Credits:4
After the completion of this course, the students should be able to				
1	Defining the fundamentals of writing Python scripts.			
2	Expressing the Core Python scripting elements such as variables and flow control structures.			
3	Apply Python functions to facilitate code reuse.			
4	Extending how to work with lists and sequence data.			
5	Implement file operations such as read and write and Adapting the code robust byhandling errors and exceptions properly.			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) DATA STRUCTURES AND ALGORITHMS LAB(B20CS08)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Explaining the linear data structures such as List, Stack, Queue and its applications			
2	Implement non-linear data structure such as Trees, Graphs and its applications			
3	Apply suitable algorithms for sorting Techniques			
4	Choose appropriate algorithm for Searching and Hashing			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) PYTHON PROGRAMMING LAB(B20CS07)	No. of Hours L:0 T:0 P:3	Credits:1 .5
After the completion of this course, the students should be able to				
1	Expressing the Core Python scripting elements such as variables and flow control structures.			
2	Apply Python functions to facilitate code reuse			
3	Extending how to work with lists and sequence data.			
4	Implement file operations such as read and write and Adapting the code robust byhandling errors and exceptions properly.			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) ENGLISH LANGUAGE AND INTERACTIVE COMMUNICATION SKILLS LAB(B20EN02)	No. of Hours L:0 T:0 P:3	Credits: 1.5
After the completion of this course, the students should be able to				
1	Understand the nuances of English language through audio-visual experience and groupactivities.			
2	Speak with clarity and confidence which in turn enhances their employability skills.			
3	Develop their listening skills so that they may appreciate its role in developing LSRW skills language and improve their pronunciation.			
4	Involve the students in speaking activities in various contexts.			

Course Outcome	Year / semester II Sem	Subject Name (Subject Code) ENGINEERING & IT WORKSHOP LAB(B20ME03)	No. of Hours L:0 T:0 P:3	Credits: 1.5
After the completion of this course, the students should be able to				
1	Know the fundamental knowledge of House wiring and soldering and their usage in real time Applications.			
2	Gain knowledge on electronic components and measuring instruments.			
3	Use basic concepts of computer hardware for assembly and disassembly.			
4	Use Microsoft tools for exercise.			
Course Outcome	**Year / semester III Sem**	**Subject Name (Subject Code)** DESIGN AND ANALYSIS OF ALGORITHMS(B20CS10)	**No. of Hours L:3 T:0 P:0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Expose student's to few known methods of solution processes, build new solution algorithms, analyze the asymptotic performance of algorithms and to write rigorous correctness proofs for algorithms.			
2	Identify appropriate data structures and algorithm design methods for specified classes of applications;			
3	Perceive how the choice of data structures and algorithm design methods would impact the performance of programs and how to compare them.			
4	Design methods such as the greedy method, divide and conquer, dynamic programming, backtracking and branch and bound			
5	Perceive methods to deal with logarithmic type, polynomial type and non-polynomial type of classesof problems and Synthesis of efficient algorithms in common engineering design situations would bediscussed			
Course Outcome	**Year / semester III Sem**	**Subject Name (Subject Code)** DIGITAL LOGIC DESIGN & MICRO PROCESSORS(B20EC09)	**No. of Hours L:3 T:0 P:0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Understand the basic concepts of different Number systems and basic theorems using inBoolean algebra.			
2	Design the logic circuits using basic logic gates by reducing the Boolean expressions with thehelp of Karnaugh Map.			
3	Analyze various types of combinational and sequential circuits.			
4	Analyze various types of sequential circuits.			
5	Understand the internal organization of popular8086 microprocessors			
Course Outcome	**Year / semester III Sem**	**Subject Name (Subject Code)** MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE(B20CS11)	**No. of Hours L:3 T:0 P:0**	**Credits: 3**
After the completion of this course, the students should be able to				
1	Evaluate the notions of propositions, predicate formulae, Rules of inference.			
2	Illustrate and describe various types of Relations and Functions.			
3	Apply knowledge of Mathematics, Combinations & Permutations, Binomial Multinomial theorems, Pigeon hole principles			
4	Develop to solve the recurrence relations by using various methods			
5	Perceive the basic concepts of graph theory and apply for real time examples.			

Course Outcome	Year / semester III Sem	Subject Name (Subject Code) JAVA PROGRAMMING (B20CS12)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Understand the use of OOP concepts and solve real world problems using OOP techniques.			
2	Solve the inter-disciplinary applications using the concept of inheritance.			
3	Develop robust and faster applications by applying different exception handling mechanisms.			
4	Understand the multithreading concepts and develop efficient applications.			
5	Design GUI based applications and develops applets for web applications.			
Course Outcome	Year / semester III Sem	Subject Name (Subject Code) ENGLISH FOR EFFECTIVE COMMUNICATIONS(B20EN01)	No. of Hours L:2 T:0 P:0	Credits: 2
After the completion of this course, the students should be able to				
1	Skim and scan the digital text to summarize it for future reference.			
2	Read the text to make notes according to their needs.			
3	Use English language effectively in spoken and written forms.			
4	Communicate confidently in various contexts and different cultures			
5	Acquire basic proficiency in English including reading and listening comprehension, writing and speaking skills.			
Course Outcome	Year/semester III Sem	Subject Name (Subject Code) DIGITAL LOGIC DESIGN & MICRO PROCESSORS LAB(B20EC10)	No. of Hours L:0 T:0 P:3	Credits:1 .5
After the completion of this course, the students should be able to				
1	Demonstrate various types of logic gates (AND, OR, NOT, NAND, NOR, XOR,XNOR) and flip flops.			
2	Analyze and design various types of combinational and sequential circuits.			
3	Develop microprocessor based programs for Arithmetic and Logical Operations			
4	Develop microprocessor based programs for various problems.			
Course Outcome	Year / semester III Sem	Subject Name (Subject Code) DESIGN AND ANALYSIS OF ALGORITHMS LAB(B20CS13)	No. of Hours L:0 T:0 P:3	Credits: 1.5
After the completion of this course, the students should be able to				
1	Ability to choose appropriate algorithm design techniques for solving problems.			
2	Design an algorithm in an effective manner			
3	Design and apply iterative and recursive algorithms			
4	Ability to analyze the performance of algorithms.			
Course Outcome	Year / semester III Sem	Subject Name (Subject Code) JAVA PROGRAMMING LAB(B20CS14)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Use the Java SDK environment to create, debug and run simple Java programs.			
2	Write Java programs to implement error handling techniques using exception handling			
3	Develop multithreaded applications with synchronization.			
4	Design simple Graphical User Interface applications and event driven programming.			

Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) OPERATING SYSTEMS (B20CS16)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Compare various Operating Systems architectures, IO structures, Network Structure			
2	Analyze the virtual memory, paging and memory allocation techniques for variousapplications			
3	Apply Deadlock prevention and Deadlock Detection algorithms and perceive the working of an operating system as a File manager, I/O manager, Process manager.			
4	Understand the overview of Disk Storage Structure.			
5	Analyze assess access controls to protect files.			

Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) FORMAL LANGUAGES AND AUTOMATA THEORY(B20CS17)	No. of Hours L:3 T:0 P:0	Credits: 3
After the completion of this course, the students should be able to				
1	Explain basic concepts in formal language theory, grammars, automata theory(DFA&NFA), computability theory, and complexity theory.			
2	Know the production rules of regular expressions and grammars, including context:free and context: sensitive grammar			
3	Construct a pushdown automata and context free, regular, normal form grammars todesign computer languages			
4	Evaluate solution for various problems using a theoretical computer (Turing machine)for a computer language			
5	Explain the relationship among language classes and grammars with the help of Chomsky Hierarchy, and Distinguish between decidability and undecidability.			

Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) COMPUTER ORGANIZATION & ARCHITECTURE(B20CS18)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Understand the structure, function of various functional units of computer.			
2	Understand the basic design of Computer, and its organization			
3	Perceive control unit operations and Micro Program example.			
4	Understand different computer arithmetic algorithms for various arithmetic operation			
5	Identity and compare different methods of input-output.			

Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) DATABASE MANAGEMENT SYSTEMS(B20CS19)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Perceive the fundamental concepts of database management.			
2	Analyze database models & Entity Relationship models and to draw the E-R diagram forthe given case study.			
3	Apply relational Database Theory, and be able to write relational algebra expressions forqueries			
4	Apply Normalization Process to construct the database and explain Basic Issues ofTransaction processing			
5	Compare the basic Database storage structures and access techniques: File Organizationindexing methods including B- Tree and Hashing			

Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) PROBABILITY AND STATISTICS(B20MA07)	No. of Hours L:3 T:0 P:3	Credits:3
After the completion of this course, the students should be able to				
1	Use probability theory and deals with modeling uncertainty in order to evaluateThe probability of real world events.			
2	Develop discrete probability distributions and its applications, and use the techniques togenerate data from Binomial and Poisson Distributions.			
3	Use the techniques of continuous probability distributions to generate data from Normal Distributions.			
4	Perform correlation and regression analysis, in order to estimate the nature and thestrength of the linear relationship between two variables.			
5	Construct confidence interval to estimates population parameters to test the hypothesis.			
Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) OPERATING SYSTEMS LAB(B20CS20)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Apply CPU scheduling algorithms, Page replacement algorithms.			
2	Explain Bankers Algorithm for Dead Lock Avoidance & Dead Lock Prevention			
3	Describe the concepts of paging and segmentation.			
4	Make use of Linux commands			
Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) DATABASE MANAGEMENT SYSTEMS LAB(B20CS21)	No. of Hours L:0 T:0 P:3	Credits: 1.5
After the completion of this course, the students should be able to				
1	Design database schema for given Application.			
2	Transform ER Model to Relational Model.			
3	Apply the normalization techniques for development of application software to realisticproblems.			
4	Construct SQL queries to retrieve information from database			
Course Outcome	Year / semester IV Sem	Subject Name (Subject Code) WEB TECHNOLOGIES LAB(B20CS22)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's			
2	Understand, analyze and apply the role of languages like HTML, CSS, XML, JavaScript, PHPand protocols in the workings of the web and web applications			
3	Create dynamic web pages using JavaScript			
4	Build web applications using PHP			
Course Outcome	Year / semester V Sem	Subject Name (Subject Code) SOFTWARE ENGINEERING(B20CS29)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Define Software Engineering and list core principles of software engineering and understand various process models			
2	Develop an understanding of software requirements and be able to prepare SRS document.			
3	Understand software design engineering process using structural and object oriented approaches and be able to model			
4	Differentiate the techniques of verification and validation in the process of softwaredevelopment, Apply the testing strategies on different level of implementation (unit,integration,…)			
5	Understand and able to compute quality measures and develop a software quality assurance plan for a software development.			

Course Outcome	Year / semester V Sem	Subject Name (Subject Code) DATA COMMUNICATIONS AND COMPUTER NETWORKS(B20CS30)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Illustrate basic computer network technology, functions of each layer in the OSI and TCP/IP reference model.			
2	Gain the knowledge on error control and flow control mechanisms.			
3	Obtain the skills of subnetting and routing mechanisms.			
4	Analyze the features and Operations of TCP/UDP, congestion control and QoS Techniques.			
5	Familiarity with the essential protocols of application layer, and how they can be used in network design and implementation.			
Course Outcome	**Year / semester V Sem**	**Subject Name (Subject Code)** DATA WAREHOUSING AND DATA MINING(B20CS24)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Develop an understanding of data warehouse, designing and using data in data warehouse using various operations.			
2	Introduce data mining concepts and develops understanding of data mining application.			
3	Develop an outlook of Association rule mining, association rule mining methods and their application on some sample data sets, evaluate these methods based on need.			
4	Develop an understanding of classification and prediction, classification methods and their application on some sample data sets, evaluate these methods based on need			
5	Develop conceptual understanding of clustering, various clustering methods and their application on some sample data sets, evaluate these methods based on need.			
Course Outcome	**Year / semester VSem**	**Subject Name (Subject Code)** ARTIFICIAL INTELLIGENCE (B20AI03)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Possess the ability to formulate an efficient problem space for a problem expressed in English.			
2	Possess the ability to select a search algorithm for a problem.			
3	Possess the skill for representing knowledge using the appropriate technique			
4	Possess the ability to apply AI techniques to solve problems of Game Playing.			
5	Possess the Expert Systems, Machine Learning and Natural Language Processing			
Course Outcome	**Year / semester VSem**	**Subject Name (Subject Code)** COMPILER DESIGN(B20CS31) (PROFESSIONAL ELECTIVE-I)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Apply the knowledge of modern phases of compiler and its features.			
2	Identify the similarities and differences among varies parsing techniques.			
3	Explain semantic analysis in the context of the compilation process.			
4	Design a symbol table format for the language defined by a grammar			
5	Analyze the code generation algorithm			
Course Outcome	**Year / semester V Sem**	**Subject Name (Subject Code)** PRINCIPLES OF PROGRAMMING LANGUAGES (B20CS32) (PROFESSIONAL ELECTIVE-I)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Able to analyze syntax-related concepts including context-free grammars, parse trees, semantic issues associated with function implementations.			
2	Summarize the design issues of various reference types and its implementation related to these types.			
3	Able to understand the concepts of Abstraction and Encapsulation constructs of classes, interfaces, packages of various Language Examples.			
4	Ability to understand the nature and implementation of object-oriented languages.			
5	Able to Compare the Functional Programming Languages and Logic Programming Languages.			

Course Outcome	Year / semester V Sem	Subject Name (Subject Code) NETWORK PROGRAMMING (B20CS33) (PROFESSIONAL ELECTIVE-I)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Demonstrate advanced knowledge of OSI layers, TCP & UDP concepts			
2	Networking. Summarize the TCP socket functions and Byte Ordering.			
3	Make use of TCP client server applications and analyze I/O Multiplexing and socket options.			
4	Define about the Elementary UDP sockets and Address conversions.			
5	Explain DNS, other networking information, Pseudo -Terminals, Terminal modes, Control Terminals.			
Course Outcome	Year / semester V Sem	Subject Name (Subject Code) DATA COMMUNICATIONS AND COMPUTER NETWORKS LAB(B20CS34)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Implement data link layer farming methods.			
2	Analyze error detection and error correction codes.			
3	Implement and analyze routing and congestion issues in network design.			
4	Implement Encoding and Decoding techniques used in presentation layer.			
Course Outcome	Year / semester V Sem	Subject Name (Subject Code) ARTIFICIAL INTELLIGENCE LAB (B20AI04)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Demonstrate Knowledge of the building blocks of AI as presented in terms of intelligent agents.			
2	Analyze and formalize the problem as a state space, graph and design heuristics			
3	Develop intelligent algorithms for constraint satisfaction problems and also design intelligent systemsfor game playing.			
4	Attain the capability to represent various real life problem domains using logicbased techniques anduse this to perform inference or planning.			
Course Outcome	Year / semester V Sem	Subject Name (Subject Code) INDIAN CONSTITUTION(B20MC03)	No. of Hours L:2 T:0 P:0	Credits:0
After the completion of this course, the students should be able to				
1	Demonstrate the fundamental rights and duties of a citizen			
2	Classify the administrative structure of the Indian union			
3	Identify the power of state government and make use of positions			
4	Categorize the various department and local administrations responsibilities			
5	Functions of election commission and its roles			
Course Outcome	Year / semester VISem	Subject Name (Subject Code) MACHINE LEARNING (B20AI06)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course the students should be able to :				
1	Explain the theory underlying machine learning			
2	Learn beyond binary classification.			
3	Recognize and implement various genetic algorithms.			
4	Construct algorithms to learn tree, to learn linear, non-linear models and Probabilistic models.			
5	Able to analyze the data using R Programming			

Course Outcome	Year / semester VI Sem	Subject Name (Subject Code) CLOUD COMPUTING (B20CS36)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Ability to understand various service delivery models of a cloud computing architecture.			
2	Ability to understand the ways in which the cloud can be programmed and deployed			
3	Understanding Cloud Computing Architecture and Management			
4	Understanding cloud service Models			
5	Understanding cloud service providers.			
Course Outcome	**Year / semester VI Sem**	**Subject Name (Subject Code)** INTERNET OF THINGS(B20CS37)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Interpret the vision of IoT from global context.			
2	Perceive building blocks of Internet of Things and its characteristics.			
3	Learn the basic concepts of Python. Implement the python programming using Raspberry.			
4	Perceive the application areas of IoT. Realize the revolution of Internet in Mobile Devices, Cloud &Sensor Networks			
5	Determine the Market perspective of IoT. Develop Python web applications and cloud servers for IoT.			
Course Outcome	**Year / semester VI Sem**	**Subject Name (Subject Code)** SOFTWARE PROJECT MANAGEMENT (PROFESSIONAL ELECTIVE-II) (B20CS38)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Gain knowledge of software economics, phases in the life cycle of software development, project organization, and project control and process instrumentation.			
2	Summarize software economics, software development life cycle, artifacts of the process, workflows, checkpoints, project organization and responsibilities, project control and process instrumentation			
3	Choose the right software development approach. Compare various project organizations and responsibilities.			
4	Analyze the major and minor milestones, artifacts and metrics for management and technical perspective.			
5	Design software product using conventional and modern principles of software project management.			
Course Outcome	**Year / semester VI Sem**	**Subject Name (Subject Code)** NETWORK SECURITY AND CRYPTOGRAPHY (B20CS39) (PROFESSIONAL ELECTIVE-II)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Identifies various types of vulnerabilities, attacks, mechanisms and security services.			
2	Compare and contrast symmetric and asymmetric encryption algorithms.			
3	Implementation of message authentication, hashing algorithms and able to understand kerberos.			
4	Explore the attacks and controls associated with IP, transport level, web and E-mail security.			
5	Develop intrusion detection system, solutions for wireless networks and designing of varioustypes of firewalls.			

Course Outcome	Year / semester VI Sem	Subject Name (Subject Code) WEB SERVICES (B20CS40) (PROFESSIONAL ELECTIVE-II)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Implement Web service client and server with interoperable systems like core distributed computing,J2EE, SOA, WSDL, UDDI and EBXML			
2	Perceive and analyze the principles of SOAP.			
3	Perceive the implement Web Services life cycle, Anatomy ofWSDL definition document.			
4	How to utilize the semantics of web services. Working with UDDI, programming with UDDI, UDDIdata structures			
5	Explore interoperability between different frameworks. Design web based applications that use webservices			
Course Outcome	Year / semester VI Sem	Subject Name (Subject Code) MACHINE LEARNING LAB (B20AI08)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Discuss different application on Machine Learning problems.			
2	Describe various algorithms on Machine Learning mentioning its strengths andweaknesses.			
3	Improve the performance of Machine Learning algorithms with different parameters			
4	Understand the latest issues raised by current researchers.			
Course Outcome	Year / semester VI Sem	Subject Name (Subject Code) CLOUD COMPUTING LAB(B20CS41)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Analyze Cloud Computing fundamentals, technologies, applications and implementation of virtualization with Oracle VM Virtual box.			
2	Development knowledge of cloud computing using Amazon Web Services like Compute, Storage and Networking.			
3	Providing Security to the Cloud System using Identity Access Management**(IAM).**			
4	Attain the Capability of design, development of agile and highly available systems usingAmazon Web Services.			
Course Outcome	Year / semester VI Sem	Subject Name (Subject Code) INTERNET OF THINGS LAB(B20CS42)	No. of Hours L:0 T:0 P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Improve the quality of life of humans through IoT technology for that student closer interaction between the experiment and the society.			
2	Identify the Components that forms part of IoT specific Application.			
3	Determine the most appropriate IoT Devices and Sensors based on IoT application.			
4	Improve the Python programming skills for writing IoT Application			
Course Outcome	Year / semester VI Sem	Subject Name (Subject Code) LOGICAL REASONING AND QUANTITATIVE APTITUDE(B20MC05)	No. of Hours L:2 T:0 P:0	Credits:0
After the completion of this course, the students should be able to				
1	Apply quantitative reasoning and mathematical analysis methodologies to understand and solve problems.			
2	Apply quantitative correctly arrive at meaningful conclusions regarding their answers and manipulate equations and formulas in order to solve for the desired variable			
3	Interpret given information correctly, determine which mathematical model best describes the data,and apply the model correctly.			
4	Correctly apply mathematical language and notation to explain the reasoning underlying their conclusions when solving problems using mathematical or statistical techniques.			
5	Improve their mathematical skills in various general aspects to solve real time problems.			

Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) DEEP LEARNING(B20AI10)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Understand the basics of Artificial Neural Networks.			
2	Describe the various Learning Networks and Special Networks.			
3	Understand the Deep Neural Network.			
4	Develop different parameters for Regularization for Deep Learning.			
5	Design Optimized for training Deep Models			
Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS(B20MB01)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Understand the nature, scope and importance of Managerial Economics.			
2	Know what demand is, analyze demand and how elasticity of demand is used for pricingdecisions and to evaluate methods for forecasting demand.			
3	Know how production function is carried out to achieve least cost combination of Inputsand how to analyze cost.			
4	Understand the characteristics of different kinds of markets and outline different form ofbusiness organization and analyze how capital budgeting techniques are used for investment decisions.			
5	Know how to prepare final accounts and how to interpret them, analyze and interpretfinancial statements using ratio analysis.			
Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) SOFTWARE TESTING(B20CS44) (PROFESSIONAL ELECTIVE – III)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Design test cases suitable for a software development for different domains.			
2	Prepare test planning based on the document.			
3	Identify suitable tests to be carried out.			
4	Validate test plan and test cases designed.			
5	Use of automatic testing tools.			
Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) SOFTWARE ORIENTED ARCHITECTURE (PROFESSIONAL ELECTIVE – III) (B20CS45)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Design various service layers			
2	Model service candidate derived from existing business documentation.			
3	Design the composition of SOA.			
4	Design application services for technology abstraction.			
5	Principles of Service-Orientation.			
Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) SCRIPTING LANGUAGES (B20CS46) (PROFESSIONAL ELECTIVE – III)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Perceive of scripting and the contributions of scripting languages.			
2	Develop simple scripts to automate system administration.			
3	Gain knowledge of the strengths and weakness of Perl, TCL and Ruby; and select an appropriate language for solving a given problem.			
4	Acquire programming skills in scripting language			
5	Develop simple applications by various tools and expose to create advanced applications on web applications.			

Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) BUSINESS INTELLIGENCE & BIG DATA (PROFESSIONAL ELECTIVE – IV) (B20CS47)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Explain the foundations, definitions and capabilities of Bigdata.			
2	List the definitions, concepts, architectures and challenges in Big data environment. Outline the definitions, concepts, and enabling technologies of big data analytics.			
3	Understand concepts on Handoop Ecosystem in Big data.			
4	Analyze the Map reduce programming in Big data Analytics.			
5	Apply Security big data technologies in business intelligence using geospatialλ data, location-based analytics, social networking, Web 2.0, reality mining, and cloud computing.			
Course Outcome	**Year / semester VII Sem**	**Subject Name (Subject Code)** REINFORCEMENT LEARNING (B20AI15) (PROFESSIONAL ELECTIVE – IV)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Understand the key features of Reinforcement Learning.			
2	Apply the different algorithms and define the policy.			
3	Analyze multiple criteria for analyzing RL algorithms and evaluate algorithms on these metrics.			
4	Evaluate the eligibility traces, Eligibility traces used for sampling.			
5	Create Function Approximation Methods.			
Course Outcome	**Year / semester VII Sem**	**Subject Name (Subject Code)** CYBER SECURITY & ETHICAL HACKING (B20CS48) (PROFESSIONAL ELECTIVE – IV)	**No. of Hours L:3 T:0 P:0**	**Credits:3**
After the completion of this course, the students should be able to				
1	Outline key terms and concepts in cyber law, intellectual property and cybercrimes.			
2	Explore the vulnerabilities, threats and cybercrimes posed by criminals.			
3	Identify various security challenges phased by mobile devices.			
4	Identify various types of tools and methods used in cybercrime, develops the secure counter methods to maintain security protection			
5	Analyze the cyber security risk management policies in order to adequately protect an organization's critical information and assets.			
Course Outcome	**Year / semester VII Sem**	**Subject Name (Subject Code)** MINI PROJECT & INTERNSHIP (B20CS49)	**No. of Hours L:0 T:0 P:0**	**Credits:2**
1	Enhance students' knowledge in current technology			
2	Develop leadership ability and responsibility to execute the given task			
3	Enhance their employability skills along with real corporate exposure			
4	Elaborate the completed task and compile the report.			
Course Outcome	**Year / semester VII Sem**	**Subject Name (Subject Code)** DEEP LEARNING LAB (B20AI13)	**No. of Hours L:0 T:0 P:3**	**Credits:1.5**
After the completion of this course, the students should be able to				
1	Understand the basics of Artificial Neural Networks.			
2	Describe the various Learning Networks and Special Networks			
3	Understand the Deep Neural Network.			
4	Develop different parameters for Regularization for Deep Learning.			

Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) MAJOR PROJECT PHASE-I (B20CS50)	No. of Hours L:0 T:0 P:8	Credits:4
1	Identify the problem by applying acquired knowledge.			
2	Analyze and categorize executable project modules.			
3	Choose efficient tools for designing project modules.			
4	Combine all the modules through effective team work after efficient testing			
5	Elaborate the completed task and compile the project report.			

Course Outcome	Year / semester VII Sem	Subject Name (Subject Code) HUMAN VALUES AND PROFESSIONAL ETHICS(B20MC05)	No. of Hours L:2 T:0 P:0	Credits:0
After the completion of this course, the students should be able to				
1	Perceive the importance of ethics and values in life and society.			
2	Develop moral responsibility and mould them as best professionals.			
3	Create ethical vision and achieve harmony in life.			
4	Provide a critical perspective on the socialization of men and women			
5	Perceive the important issues related to gender in contemporary India			

Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) DESIGN PATTERNS (B20CS51) (PROFESSIONAL ELECTIVE – V)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Identify the appropriate design patterns to solve object oriented design problems.			
2	Identify and implement appropriate solutions to recurring programming problems by consulting technical documentation and specifications, including design pattern catalogs and existing source code.			
3	Understand basic elements of structural patterns and their implementation.			
4	Understand basic elements of creational patterns and their implementations.			
5	Understand basic elements of behavioral patterns and their implementation along with growth in the field of using design patterns			

Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) BLOCK CHAIN TECHNOLOGIES (B20CS52) (PROFESSIONAL ELECTIVE – V)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Introduce the fundamentals of blockchain, history, technology and decentralization.			
2	Revise cryptographic concepts and its use in blockchain.			
3	Define bitcoin and understand structure of blockchain, alternatives to proof of work.			
4	Introduce smart contracts, solidity and Web3 to implement blockchain			
5	Understand applications of blockchain and its challenges			

Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) PRINCIPLES OF ROBOTICS(B20AI24) (PROFESSIONAL ELECTIVE – V)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Understand Robotic Process Automation & Bot Creation.			
2	Apply methods for Bots Upload and Credentials.			
3	Analyze devices to Develop and Runtime Clients and Device Pools.			
4	Develop Bot creator using XML commands.			
5	Create work flow designer			

Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) COMPUTER VISION (B20AI26) (PROFESSIONAL ELECTIVE – VI)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Elaborate development of algorithms and techniques.			
2	Analyze and interpret the visible world around us with real time problems.			
3	Apply the fundamental concepts on multi-dimensional signal processing, feature extraction, pattern analysis visual geometric modeling, stochastic optimization etc.			
4	Take part to makeup and contribute in research developments in the field of computer vision.			
5	Explain different applications ranging from Biometrics, Medical diagnosis, document processing, mining of visual content, to surveillance, advanced rendering etc.			
Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) DATA PRIVACY & SECURITY(B20DS21) (PROFESSIONAL ELECTIVE – VI)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Understands various types of Substitution ciphers.			
2	Explore various techniques to break the ciphers and understands transposition techniques.			
3	Compare and contrast block cipher and stream cipher algorithms			
4	Implementation of asymmetric key cryptographic algorithms and understand key management in public key cryptography.			
5	Explore different types of steganography techniques to hide the data in text and images.			
Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) NATURAL LANGUAGE PROCESSING (PROFESSIONAL ELECTIVE – VI) (B20AI19)	No. of Hours L:3 T:0 P:0	Credits:3
After the completion of this course, the students should be able to				
1	Show sensitivity to linguistic phenomena and an ability to model them with formal grammars.			
2	Understand and carry out proper experimental methodology for training and evaluating empirical NLP systems			
3	Able to manipulate probabilities, construct statistical models over strings and trees, and estimate parameters using supervised and unsupervised training methods.			
4	Able to design, implement, and analyze NLP algorithms			
5	Able to design different language modelling Techniques.			
Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) TECHNICAL SEMINAR(B20CS53)	No. of Hours L:0 T:0 P:2	Credits:1
After the completion of this course, the students should be able to				
1	Identify recent technical topics from interested domains.			
2	Analyze the applicability of modern tools and technology.			
3	Discuss and justify the technical aspects of the chosen topic in a systematic approach			
4	Develop Presentation and Communication skills.			
Course Outcome	Year / semester VIII Sem	Subject Name (Subject Code) MAJOR PROJECT PHASE-II(B20CS54)	No. of Hours L:0 T:0P:16	Credits:8
After the completion of this course, the students should be able to				
1	Identify the problem by applying acquired knowledge.			
2	Analyze and categorize executable project modules.			
3	Choose efficient tools for designing project modules.			
4	Combine all the modules through effective team work after efficient testing			
5	Elaborate the completed task and compile the project report.			