



**SRKR ENGINEERING COLLEGE::BHIMAVARAM**  
**Department of Computer Science and Engineering**

**R19**

**COURSE OUTCOMES**

**Program Name: B.Tech (Computer Science and Engineering)**  
**Course Name: (ENGLISH)**

COURSE	COURSE OUTCOMES	
ENGLISH B19 HS 1101	HS 1101.1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
	HS 1101.2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
	HS 1101.3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
	HS 1101.4	Understand and apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
	HS 1101.5	Construct sentences using proper grammatical structures and correct word forms.

**Course Name: (MATHEMATICS-I)**

COURSE	COURSE OUTCOMES	
MATHEMATICS-I B19 BS 1101	BS 1101 .1	Solve a given system of linear algebraic equations.
	BS 1101 .2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
	BS 1101 .3	Solve linear ordinary differential equations of first order and first degree.
	BS 1101 .4	Apply the knowledge in simple applications such as Newton's law of cooling,

		orthogonal trajectories and simple electrical circuits.
	BS 1101 .5	Solve linear ordinary differential equations of second order and higher order.
	BS 1101 .6	Determine Laplace transform and inverse Laplace transform and solve linear ODE.

**Course Name: (MATHEMATICS-II)**

COURSE	COURSE OUTCOMES	
MATHEMATICS-II  B19 BS 1102	BS 1102 .1	Fit an interpolation formula and perform interpolation for an equally spaced data as well as unequally spaced data.
	BS 1102 .2	Find a real root of algebraic and transcendental equations, evaluate numerically certain definite integrals & solve a first order ordinary differential equation by Euler and RK methods.
	BS 1102 .3	Compute partial derivatives, total derivative and Jacobian
	BS 1102 .4	Find maxima/minima of functions of two variables and evaluate some real definite integrals
	BS 1102 .5	Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs.
	BS 1102 .6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

**Course Name: (APPLIED CHEMISTRY)**

COURSE	COURSE OUTCOMES	
APPLIED CHEMISTRY B19 BS 1105	BS 1105.1	At the end of the course the students learn the advantages and limitations of plastics materials and their use in design.
	BS 1105.2	Fuels which are used commonly and their economics, advantages and limitations are discussed.
	BS 1105.3	Students gained knowledge reasons for corrosion and some methods of corrosion control.

	BS 1105.4	Students understands the impurities present in raw water, problems associated with them and how to avoid them.
	BS 1105.5	Similarly, students understand liquid crystals and semiconductors. Students can gain the building materials, solar materials, lubricants and energy storage devices.

**Course Name: (COMPUTER FUNDAMENTALS & PROBLEM SOLVING USING C)**

COURSE	COURSE OUTCOMES	
COMPUTER FUNDAMENTALS & PROBLEM SOLVING USING C B19 CS 1101	CS 1101.1	The student will be able to develop Flow charts and write algorithms.
	CS 1101.2	The student will be able to develop efficient algorithms for solving a problem using the constructs of a programming language like conditional, iteration and recursion.
	CS 1101.3	The student will able write programs using functions and arrays
	CS 1101.4	The student will able write programs using Pointers and Structures
	CS 1101.5	The student will able write programs for Files

**Course Name: (APPLIED CHEMISTRY LAB)**

COURSE	COURSE OUTCOMES	
APPLIED CHEMISTRY LAB B19 BS 1108	BS 1108.1	An understanding of Professional and develop confidence on recent trends.
	BS 1108.2	Able to gain technical knowledge of measuring, operating and testing of chemical instruments and equipment.
	BS 1108.3	Acquire ability to apply real time knowledge of chemistry.
	BS 1108.4	Exposed to the real time working environment.
	BS 1108.5	Demonstrate the ability to learn Principles, design and conduct experiments.
	BS 1108.6	Ability to work on laboratory and multidisciplinary tasks.

**Course Name: (ENGLISH LAB)**

COURSE	COURSE OUTCOMES	
ENGLISH LAB B19 HS 1102	HS 1102.1	Remember and understand the different aspects of English language proficiency with emphasis on LSRW skills.
	HS 1102.2	Apply communication skills through various language learning activities.
	HS 1102.3	Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening comprehension.
	HS 1102.4	Exhibit an acceptable etiquette essential in social settings.
	HS 1102.5	Get awareness on mother tongue influence and neutralize it in order to improve fluency and clarity in spoken English.

**Course Name: (COMPUTER FUNDAMENTALS & PROBLEM-SOLVING USING C LAB)**

COURSE	COURSE OUTCOMES	
COMPUTER FUNDAMENTALS & PROBLEM- SOLVING USING C LAB B19 CS 1104	CS 1104.1	Gains Knowledge on various concepts of a C language.
	CS 1104.2	Able to draw flowcharts and write algorithms.
	CS 1104.3	Able to design and develop of C problem solving skills.
	CS 1104.4	Able to design and develop modular programming skills.
	CS 1104.5	Able to trace and debug a program
	CS 1104.6	Able to Identify various computer components, Installation of software

**SEMESTER: 2****COURSE YEAR: 2019-2020****Course Name: (MATHEMATICS-III)**

COURSE	COURSE OUTCOMES	
MATHEMATICS-III B19 BS 1202	BS 1202.1	Determine Fourier series and half range series of functions.
	BS 1202.2	Find different Fourier transforms of non-periodic functions and also use them to evaluate integrals.
	BS 1202.3	Use the knowledge of Beta and Gamma functions in evaluating improper integrals.
	BS 1202.4	Evaluate double integrals, simple triple integrals & find areas and volume.
	BS 1202.5	Find the gradient of a scalar function, divergence and curl of a vector function, Determine scalar potential.
	BS 1202.6	Apply Green's, Stokes' and Gauss divergence theorems to solve problems.

**Course Name: (APPLIED PHYSICS)**

COURSE	COURSE OUTCOMES	
APPLIED PHYSICS B19 BS 1203	BS 1203.1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications.
	BS 1203.2	Explain the properties of dielectric and magnetic materials suitable for engineering applications.
	BS 1203.3	Explain the important aspects of semiconductors and electrical conductivity in them.
	BS 1203.4	Understand the basics of modern technologies lasers, optical fibers and ultrasonics and their utility in various fields.
	BS 1203.5	Demonstrate the synthesis methods and applications of nano materials.

**Course Name: (DIGITAL LOGIC DESIGN)**

COURSE	COURSE OUTCOMES	
DIGITAL LOGIC DESIGN B19 CS 1202	CS 1202.1	An ability to define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation. The different Boolean algebra theorems and apply them for logic functions.
	CS 1202.2	An ability to define the Karnaugh map for a few variables and perform an algorithmic reduction of logic functions.
	CS 1202.3	An ability to define the following combinational circuits: multiplexer, de-multiplexers encoders/decoders, comparators, arithmetic-logic units and to be able to build simple circuits.
	CS 1202.4	An ability to understand asynchronous and synchronous sequential circuits, like counters and shift registers.
	CS 1202.5	An ability to understand memories like RAM and ROM, Programmable Logic Array and Programmable Array Logic.

**Course Name: (BASIC DATA STRUCTURES AND PYTHON PROGRAMMING)**

COURSE	COURSE OUTCOMES	
BASIC DATA STRUCTURES AND PYTHON PROGRAMMING B19 CS 1203	CS 1203.1	Ability to implement various searching and sorting techniques.
	CS 1203.2	Student will be able to write programs to implement stack and queues
	CS 1203.3	Proficiency in creating based applications using the Python Programming Language.
	CS 1203.4	To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
	CS 1203.5	To be able to draw various kinds of plots using PyLab and Event driven Programming

**Course Name: (ENGINEERING DRAWING)**

COURSE	COURSE OUTCOMES	
ENGINEERING DRAWING B19 ME 1201	ME 1201.1	Apply principles of drawing to Construct polygons and engineering curves.
	ME 1201.2	Apply principles of drawing to draw the projections of points and lines.
	ME 1201.3	Apply principles of drawing to draw the projections of planes
	ME 1201.4	Apply principles of drawing to draw the projections of solids.
	ME 1201.5	Apply principles of drawing to represent the object in 3D view through isometric views.

**Course Name: (APPLIED PHYSICS LAB)**

COURSE	COURSE OUTCOMES	
APPLIED PHYSICS LAB B19 BS 1206	BS 1206.1	Students get hands on experience in setting up experiments and using the instruments / equipment individually.
	BS 1206.2	Get introduced to using new / advanced technologies and understand their significance.

**Course Name: (BASIC DATA STRUCTURES AND PYTHON PROGRAMMING LAB)**

COURSE	COURSE OUTCOMES	
BASIC DATA STRUCTURES AND PYTHON PROGRAMMING LAB B19 CS 1205	CS 1205.1	Student will be able to write programs to implement stack and queues.
	CS 1205.2	Ability to implement various searching and sorting techniques.
	CS 1205.3	To develop proficiency in creating based applications using the Python Programming Language.
	CS 1205.4	To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
	CS 1205.5	To be able to do testing and debugging of code written in Python.
	CS 1205.6	To be able to draw various kinds of plots using PyLab.
	CS 1205.7	To be able to do text filtering with regular expressions in Python.

**Course Name: (COMMUNICATION SKILLS LAB)**

COURSE	COURSE OUTCOMES	
COMMUNICATION SKILLS LAB B19 HS 1203	HS 1203.1	Learn different aspects of English language proficiency in LSRW skills.
	HS 1203.2	Apply communication skills through various language learning activities.
	HS 1203.3	Draft job application letters.
	HS 1203.4	Adopt a professional etiquette in formal settings.
	HS 1203.5	Improve fluency and clarity in both spoken and written English.

**Course Name: (CONSTITUTION OF INDIA)**

COURSE	COURSE OUTCOMES	
CONSTITUTION OF INDIA B19 MC 1202	MC 1202.1	Understand historical background of the constitution making and its importance for building a democratic India.
	MC 1202.2	Understand the functioning of three wings of the government ie., executive, legislative and judiciary.
	MC 1202.3	Understand the value of the fundamental rights and duties for becoming good citizen of India.
	MC 1202.4	Analyze the decentralization of power between central, state and local self-government.
	MC 1202.5	Apply the knowledge in strengthening of the constitutional institutions like CAG, Election Commission and UPSC for sustaining democracy.
	MC 1202.6	i. Know the sources, features and principles of Indian Constitution. ii. Learn about Union Government, State government and its administration. iii. Get acquainted with Local administration and Panchayati Raj. iv. Be aware of basic concepts and developments of Human Rights. v. Gain knowledge on roles and functioning of Election Commission



**SEMESTER: 3**

**COURSE YEAR: 2020-2021**

**Course Name: (MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE)**

COURSE	COURSE OUTCOMES	
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE B19 CS 2101	CS 2101.1	Write and verify the arguments for their validity using propositional and predicate logic.
	CS 2101.2	Observe different counting methods and apply in their fields of study.
	CS 2101.3	Identify various types of relations and utilize their properties.
	CS 2101.4	Understand different Algebraic structures and their properties.
	CS 2101.5	Formulate and solve the recurrence relations.
	CS 2101.6	Utilize the concepts in graphs and trees to understand different data structures.

**Course Name: (SOFTWARE ENGINEERING)**

COURSE	COURSE OUTCOMES	
SOFTWARE ENGINEERING B19 CS 2102	CS 2102.1	Understand the different software process models and their significance.
	CS 2102.2	Distinguish various requirements gathering procedures and architectural views.
	CS 2102.3	Analyse various aspects of the system such as functionality, object and user interface.
	CS 2102.4	Identify the testing strategies for conventional and object oriented applications.
	CS 2102.5	Plan and implement various software project management activities.

**Course Name: (OBJECT ORIENTED PROGRAMMING)**

COURSE	COURSE OUTCOMES	
OBJECT ORIENTED PROGRAMMING B19 CS 2103	CS 2103.1	Illustrate Object Oriented Concepts (OOP) through C++
	CS 2103.2	Apply Inheritance and polymorphism in C++
	CS 2103.3	Apply C++ Programming on File Manipulation, Generic modules and Exception handling
	CS 2103.4	Illustrate JAVA Programming basics and features
	CS 2103.5	Implement JAVA Programming on File and thread management.

**Course Name: (ADVANCED DATA STRUCTURES)**

COURSE	COURSE OUTCOMES	
ADVANCED DATA STRUCTURES B19 CS 2104	CS 2104.1	Identify an appropriate data Structure to solve the given problem.
	CS 2104.2	Apply the knowledge of trees to construct various types of tree structures for the given data.
	CS 2104.3	Apply Graph algorithms to solve network problems.
	CS 2104.4	Identify an appropriate collision resolution technique to handle collisions.
	CS 2104.5	Apply pattern matching algorithms to find the patterns in the given data.

**Course Name: (COMPUTER ORGANIZATION)**

COURSE	COURSE OUTCOMES	
COMPUTER ORGANIZATION B19 CS 2105	CS 2105.1	Identify basic building blocks of a computer.
	CS 2105.2	Design of computer functional blocks.
	CS 2105.3	Identify the parameters that enhance system performance.

**Course Name: (OBJECT ORIENTED PROGRAMMING LAB)**

COURSE	COURSE OUTCOMES	
OBJECT ORIENTED PROGRAMMING LAB B19 CS 2106	CS 2106.1	Implement C++ programs for applying C++ object oriented features, File and exception handling.
	CS 2106.2	Develop Java applications using basic features, multi-threading and file I/O.

**Course Name: (ADVANCED DATA STRUCTURES LAB)**

COURSE	COURSE OUTCOMES	
ADVANCED DATA STRUCTURES LAB B19 CS 2107	CS 2107.1	Obtain linked list and Trees knowledge in practical applications using different languages.
	CS 2107.2	Implement graph algorithms to solve various real time applications
	CS 2107.3	Implement different Hash Tables and Pattern Matching Algorithms.

**Course Name: (PROFESSIONAL ETHICS AND HUMAN VALUES)**

COURSE	COURSE OUTCOMES	
PROFESSIONAL ETHICS AND HUMAN VALUES B19 MC 2101	MC 2101.1	Identify and analyze an ethical issue in the subject matter under investigation or in relevant field. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships and field work.
	MC 2101.2	Identify the multiple ethical interests at stake in a real-world situation or practice and Articulate what makes a particular course of action ethically defensible.
	MC 2101.3	Assess their own ethical values and the social context of problems.
	MC 2101.4	Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects.
	MC 2101.5	Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research.

**SEMESTER: 4**

**COURSE YEAR: 2020-2021**

**Course Name: (PROBABILITY AND STATISTICS)**

COURSE	COURSE OUTCOMES	
PROBABILITY AND STATISTICS B19 BS 2202	BS 2202.1	Understand the concepts of data science and fit a best suitable curve for the given data
	BS 2202.2	Identify the random variable as discrete/continuous and analyse it.
	BS 2202.3	Predict the discrete distribution suitable for the given data from its moments.
	BS 2202.4	Predict the continuous distribution suitable for the given data from its moments
	BS 2202.5	Decide the test applicable for giving inference about Population Parameter based on Sample statistic.
	BS 2202.6	Make business decisions about the resources needed to provide a service in day-to- day life applications including telecommunication, traffic engineering, computing and the design of factories, shops, offices and hospitals.

**Course Name: (ADVANCED JAVA PROGRAMMING)**

COURSE	COURSE OUTCOMES	
ADVANCED JAVA PROGRAMMING B19 CS 2201	CS 2201.1	Design and develop window-based applications with AWT/SWING components.
	CS 2201.2	Develop server-side programs in the form of servlets.
	CS 2201.3	Design and develop web-based applications with database access using JSP and JDBC.
	CS 2201.4	Develop client/server applications and TCP/IP socket programming.

**Course Name: (OPERATING SYSTEMS)**

COURSE	COURSE OUTCOMES	
OPERATING SYSTEMS B19 CS 2202	CS 2202.1	Outline the OS evaluation, its structure, concepts and services.
	CS 2202.2	Express process lifecycle, process scheduling, process synchronization and IPC.
	CS 2202.3	Explain the deadlock model characterization, its detection, prevention and recovery.
	CS 2202.4	Explain the memory hierarchy, allocation & de-allocation mechanism, virtual memory and segmentation concepts.
	CS 2202.5	Learn about the file system design, I/O principles and disk management implementation.

**Course Name: (DATA BASE MANAGEMENT SYSTEMS)**

COURSE	COURSE OUTCOMES	
DATA BASE MANAGEMENT SYSTEMS B19 CS 2203	CS 2203.1	Describe the fundamental concepts of DBMS and RDBMS.
	CS 2203.2	Design ER Models for simple application scenario.
	CS 2203.3	Apply Relational Query Languages on Relations.
	CS 2203.4	Apply SQL commands for defining, constructing and manipulating databases.
	CS 2203.5	Apply normalization techniques to improve the database design.
	CS 2203.6	Explain concurrency control and crash recovery techniques.

**Course Name: (DESIGN AND ANALYSIS OF ALGORITHMS)**

COURSE	COURSE OUTCOMES	
DESIGN AND ANALYSIS OF ALGORITHMS B19 CS 2204	CS 2204.1	Apply mathematical analysis methods to analyse the algorithm running times using asymptotic notations.
	CS 2204.2	Compare and understand how the choice of data structures impact the performance of various greedy algorithms.
	CS 2204.3	Design algorithms using advanced design techniques such as dynamic

		programming for various computationally intensive problems.
	CS 2204.4	Design algorithms using different paradigms like Divide and Conquer, Backtracking, Branch and Bound and explain the situations which call for usage of these paradigms.
	CS 2204.5	Infer lower bounds for common problems like searching, sorting, merging, selection, Understand the concepts of P, NP classes and String matching.

**Course Name: (ADVANCED JAVA PROGRAMMING LAB)**

COURSE	COURSE OUTCOMES	
ADVANCED JAVA PROGRAMMI NG LAB B19 CS 2205	CS 2205.1	Apply knowledge to improve exposure in applet programming and network programming.
	CS 2205.2	Design and develop desktop/window based applications with different AWT and SWING components.
	CS 2205.3	Design and develop web-based applications with database access using Servlets and JDBC.
	CS 2205.4	Design and develop web-based applications with database access using JSP and JDBC.

**Course Name: (UNIX OPERATING SYSTEMS LAB)**

COURSE	COURSE OUTCOMES	
UNIX OPERATING SYSTEMS LAB B19 CS 2206	CS 2206.1	The student practices UNIX commands, Vi editor, shell commands.
	CS 2206.2	The student develops skill in writing C programs using system calls for process management; inter process communication and memory management aspects.
	CS 2206.3	The student learns shell programming and develops skill for writing scripts for batch level tasks.

**Course Name: (DATA BASE MANAGEMENT SYSYSTEMS LAB)**

COURSE	COURSE OUTCOMES	
DATABASE MANAGEMENT SYSYSTEMS LAB B19 CS 2207	CS 2207.1	Write SQL commands for defining, constructing and manipulating databases.
	CS 2207.2	Write PL/SQL programs.
	CS 2207.3	Develop application for the given problem.

**Course Name: (SOCIALY RELEVANT PROJECT)**

COURSE	COURSE OUTCOMES	
SOCIALY RELEVANT PROJECT B19 CS 2208	CS 2208.1	Use scientific reasoning to gather, evaluate, and interpret ideas.
	CS 2208.2	Analyze and design solutions to solve the ideas.
	CS 2208.3	Use one or more creative tools to complete the projects.

**Course Name: (ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE)**

COURSE	COURSE OUTCOMES	
ESSENCE OF INDIAN TRADITIONAL KNOWLEDGE B19 MC 2201	MC 2201.1	Understand the concept of Traditional knowledge and its importance.
	MC 2201.2	Know the need and importance of protecting traditional knowledge.
	MC 2201.3	Know the various enactments related to the protection of traditional knowledge.
	MC 2201.4	Understand the concepts of Intellectual property to protect the traditional knowledge

**Course Name: (DATA WAREHOUSING AND DATA MINING)**

COURSE	COURSE OUTCOMES	
DATA WAREHOUSING AND DATA MINING B19 CS 3101	CS 3101.1	Identify the importance and applications of Data Mining and able to interpret the data.
	CS 3101.2	Explain the concepts of data warehousing and OLAP technology and apply data preprocessing techniques on raw data to make it suitable for data mining.
	CS 3101.3	Formulate and apply association rule mining algorithms and their performance evaluation metrics on sample datasets
	CS 3101.4	Formulate and apply classification, prediction and their respective performance evaluation metrics on sample datasets
	CS 3101.5	Illustrate, apply and compare partitional, hierarchical, density based and grid based clustering algorithms

**Course Name: (Computer Networks)**

COURSE	COURSE OUTCOMES	
COMPUTER NETWORKS B19 CS 3102	CS 3102.1	Illustrate the OSI and TCP/IP reference model
	CS 3102.2	Able to identify the MAC layer protocols and LAN technology
	CS 3102.3	Demonstrate various applications using internet protocol
	CS 3102.4	Summarize various routing and congestion control algorithms
	CS 3102.5	Make use of various application layer protocols



**Course Name: (FORMAL LANGUAGE AND AUTOMATA THEORY)**

COURSE	COURSE OUTCOMES	
FORMAL LANGUAGE AND AUTOMATA THEORY  B19 CS 3103	CS 3103.1	Construct DFA, NFA, NFA with $\epsilon$ -Transitions, Mealy and Moore machines.
	CS 3103.2	Illustrate regular expressions, equivalence of FA and Regular expressions and properties of Regular languages.
	CS 3103.3	Construct CFG, Regular grammars, simplification and Normal forms in CFG
	CS 3103.4	Illustrate properties of CFL and Construct PDA
	CS 3103.5	Summarize decidable and un-decidable problems and Construct of TM

**Course Name: (WEB TECHNOLOGIES)**

COURSE	COURSE OUTCOMES	
WEB TECHNOLOGIES B19 CS 3104	CS 3104.1	Illustrate the basic concepts of HTML and CSS & apply those concepts to design static web pages
	CS 3104.2	Identify and understand various concepts related to dynamic web pages and validate them using JavaScript
	CS 3104.3	Outline the concepts of Extensible markup language & AJAX
	CS 3104.4	Develop web Applications using Scripting Languages & Frameworks
	CS 3104.5	Create and deploy secure, usable database driven web applications using PHP

**Course Name: (COMPUTER GRAPHICS)**

COURSE	COURSE OUTCOMES	
COMPUTER GRAPHICS B19 CS 3105	CS 3105.1	Summarize the application areas of computer graphics and the working of I/O devices
	CS 3105.2	Implement algorithms for scan converting graphic primitives in a graphic package.
	CS 3105.3	Apply direct and indirect methods for two-dimensional transformations using matrices.
	CS 3105.4	Construct three-dimensional geometric transformations using matrices
	CS 3105.5	Produce two-dimensional viewing transformations
	CS 3105.6	Produce three-dimensional viewing transformations

**Course Name: (PRINCIPLES OF PROGRAMMING LANGUAGES)**

COURSE	COURSE OUTCOMES	
PRINCIPLES OF PROGRAMMING LANGUAGES B19 CS 3106	CS 3106.1	Describe the syntax and semantics of programming languages and gain practical knowledge in lexical analysis and parsing phases of a compiler
	CS 3106.2	Make use of different constructs in programming languages with merits and demerits.
	CS 3106.3	Design and implement sub programs in various programming languages
	CS 3106.4	Developing the knowledge on different programming language features like object-orientation, concurrency, exception handling and event handling
	CS 3106.5	Analyzing functional paradigm and ability to write small programs using Scheme and ML and Develop programs logic paradigm and ability to write small programs using Prolog

**Course Name: (SCRIPTING LANGUAGES)**

COURSE	COURSE OUTCOMES	
SCRIPTING LANGUAGES B19 CS 3107	CS 3107.1	Ability to understand the differences between scripting languages
	CS 3107.2	Create PHP authentication Methodology for security issue.
	CS 3107.3	Identify PHP encryption functions and Mcrypt Package
	CS 3107.4	Explain syntax and variables in TCL
	CS 3107.5	Able to gain some fluency programming in Ruby, JavaScript, Perl, Python, and related languages
	CS 3107.6	Master an understanding of python especially the object oriented concepts

**Course Name: (ADVANCED COMPUTER ARCHITECTURE)**

COURSE	COURSE OUTCOMES	
ADVANCED COMPUTER ARCHITECTURE B19 CS 3108	CS 3108.1	Illustrate the types of computers, and new trends and developments in computer architecture
	CS 3108.2	Outline pipelining, instruction set architectures, memory addressing
	CS 3108.3	Apply ILP using dynamic scheduling, multiple issue, and speculation
	CS 3108.4	Illustrate the various techniques to enhance a processors ability to exploit Instruction-level parallelism (ILP), and its challenges
	CS 3108.5	Apply multithreading by using ILP and supporting thread-level parallelism (TLP)

**Course Name: (SOFTWARE TESTING METHODOLOGIES)**

COURSE	COURSE OUTCOMES	
SOFTWARE TESTING METHODOLOGIES B19 CS 3109	CS 3109.1	Identify and understand various software testing problems, apply software testing knowledge and engineering methods and solve these problems by designing and selecting software test models, criteria, strategies, and methods
	CS 3109.2	Design and conduct a software test process for a software project
	CS 3109.3	Analyse the needs of software test automation
	CS 3109.4	Use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects
	CS 3109.5	Basic understanding and knowledge of contemporary issues in software testing, such as component-based, web based and object oriented software testing problems
	CS 3109.6	Write test cases for given software to test it before delivery to the customer and write test scripts for both desktop and web based applications

**Course Name: (COMPUTER NETWORKS LAB)**

COURSE	COURSE OUTCOMES	
COMPUTER NETWORKS LAB B19 CS 3110	CS 3110.1	Implement datalink layer framing methods like error control and flow control.
	CS 3110.2	Examines and implement the various Routing algorithms.
	CS 3110.3	Develop client-server applications using sockets.

**Course Name: (WEB TECHNOLOGIES LAB)**

COURSE	COURSE OUTCOMES	
WEB TECHNOLOGIES LAB B19 CS 3111	CS 3111.1	Analyze and apply the role of languages like HTML, CSS, XML
	CS 3111.2	Review Java Script, PHP and protocols in the workings of the web and web applications
	CS 3111.3	Apply Web Application Terminologies, Internet Tools, E – Commerce and other web services
	CS 3111.4	Develop and Analyze dynamic Web Applications using PHP & MySQL
	CS 3111.5	Install & Use Frameworks

**Course Name: (DATA MINING LAB)**

COURSE	COURSE OUTCOMES	
DATA MINING LAB B19 CS 3112	CS 3112.1	Extend the functionality of R by using add-on packages
	CS 3112.2	Examine data from files and other sources and perform various data manipulation tasks on them
	CS 3112.3	Use R Graphics and Tables to apply and visualize results of various statistical operations on data
	CS 3112.4	Apply the knowledge of R gained to data analytics and data mining of real-life datasets

**Course Name: (EMPLOYABILITY SKILLS-I)**

COURSE	COURSE OUTCOMES	
EMPLOYABILITY SKILLS-I B19 MC 3101	MC 3101.1	Detect grammatical errors in the text/sentences and rectify them while answering their competitive/ company specific tests and frame grammatically correct sentences while writing.
	MC 3101.2	Answer questions on synonyms, antonyms and other vocabulary based exercises while attempting CAT, GRE, GATE and other related tests.

	MC 3101.3	Use their logical thinking ability and solve questions related to analogy, syllogisms and other reasoning based exercises.
	MC 3101.4	Choose the appropriate word/s/phrases suitable to the given context in order to make the sentence/paragraph coherent.
	MC 3101.5	Apply soft skills in the work place and build better personal and professional relationships making informed decisions.

**Course Name: (ADVANCED CODING)**

COURSE	COURSE OUTCOMES	
ADVANCED CODING B19 MC 3103	MC 3103.1	Acquire coding knowledge on essential of modular programming
	MC 3103.2	Acquire Programming knowledge on linked lists
	MC 3103.3	Acquire coding knowledge on ADT.
	MC 3103.4	Acquire Programming skill on Java libraries and Collections

**SEMESTER: 6**

**COURSE YEAR: 2021-2022**

**Course Name: (MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTANCY)**

COURSE	COURSE OUTCOMES	
MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTANCY B19 HS 3201	HS 3201.1	Equip oneself with the knowledge of estimating the Demand and demand elasticities for a product.
	HS 3201.2	Have knowledge of Cost and its types and ability to calculate BEP
	HS 3201.3	Understand the nature of different markets
	HS 3201.4	Understand Pricing Practices prevailing in today's business world
	HS 3201.5	Prepare Financial Statements and know how to calculate Profit & Loss for a firm
	HS 3201.6	Know Types of capital and their sources and know how to calculate Depreciation

**Course Name: (COMPILER DESIGN)**

COURSE	COURSE OUTCOMES	
COMPILER DESIGN B19 CS 3201	CS 3201.1	Apply the knowledge in different phases of Compiler, specifying different types of tokens in lexical analyzer and use the Compiler tools like LEX.
	CS 3201.2	Construct top down parser, shift reduce parser for CFG.
	CS 3201.3	Construct LR parsers for CFG and summarize Syntax directed translation schemes
	CS 3201.4	Summarize intermediate code and illustrate code optimization techniques
	CS 3201.5	Illustrate code generation and runtime environments
	CS 3201.5	Apply the knowledge in different phases of Compiler, specifying different types of tokens in lexical analyzer and use the Compiler tools like LEX.

**Course Name: (UML & DESIGN PATTERNS)**

COURSE	COURSE OUTCOMES	
UML & DESIGN PATTERNS B19 CS 3202	CS 3202.1	Illustrate software development process
	CS 3202.2	Design system UML Diagrams
	CS 3202.3	Identify different system behavioural modelling techniques
	CS 3202.4	Select suitable creational pattern while designing a system
	CS 3202.5	Select suitable Behavioural pattern while designing a system

**Course Name: (ARTIFICIAL INTELLIGENCE)**

COURSE	COURSE OUTCOMES	
ARTIFICIAL INTELLIGENCE B19 CS 3203	CS 3203.1	Summarize different AI problems and their characteristics.
	CS 3203.2	Describe state space representation for solving AI problems.
	CS 3203.3	Apply optimal, heuristic search strategies for solving AI problems.
	CS 3203.4	Interpret the given facts to different knowledge representational schemes.
	CS 3203.5	Apply AI problem solving approaches to uncertainty, NLP, Planning and Expert

**Course Name: (UML LAB)**

COURSE	COURSE OUTCOMES	
UML LAB B19 CS 3205	CS 3205.1	Know the syntax of different UML diagrams.
	CS 3205.2	Create use case documents that capture requirements for a software system
	CS 3205.3	Create class diagrams that model both the domain model and design model of a software system
	CS 3205.4	Create interaction diagrams that model the dynamic aspects of a software system
	CS 3205.5	Write code that builds a software system
	CS 3205.6	Develop simple applications

**Course Name: (DATA ANALYSIS AND VISUALIZATION USING PYTHON LAB)**

COURSE	COURSE OUTCOMES	
DATA ANALYSIS AND VISUALIZATION USING PYTHON LAB B19 CS 3206	CS 3206.1	Understand the workings of various numerical techniques, different descriptive measures of Statistics, to solve the engineering problems
	CS 3206.2	Understand how to apply some linear algebra operations to n-dimensional arrays, best practices for creating basic charts
	CS 3206.3	Use NumPy perform common data wrangling and computational tasks in Python
	CS 3206.4	Use Pandas to create and manipulate data structures like Series and Data Frames.



	CS 3206.5	Work with arrays, queries, and data frames, Query Data Frame structures for cleaning and processing and manipulating files
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**Course Name: (EMPLOYABILITY SKILLS II)**

COURSE	COURSE OUTCOMES	
EMPLOYABILITY SKILLS II B19 MC 3201	MC 3201.1	Construct coherent, cohesive and unambiguous verbal expressions in both oral and written discourses.
	MC 3201.2	Analyze the given data/text and find out the correct responses to the questions asked based on the reading exercises; identify relationships or patterns within groups of words or sentences
	MC 3201.3	Write paragraphs on a particular topic, essays (issues and arguments), e mails, summaries of group discussions, reports, make notes, statement of purpose (for admission into foreign universities), letters of recommendation (for professional and educational purposes).
	MC 3201.4	Converse with ease during interactive sessions/seminars in their classrooms, compete in literary activities like elocution, debates etc., raise doubts in class, participate in JAM sessions/versant tests with confidence and convey oral information in a professional manner.
	MC 3201.5	Participate in group discussions/group activities, exhibit team spirit, use language effectively according to the situation, respond to their interviewer/employer with a positive mind, tailor make answers to the questions asked during their technical/personal interviews, exhibit skills required for the different kinds of interviews (stress, technical, HR) that they would face during the course of their recruitment process.

**Course Name: (COMPETITIVE CODING)**

COURSE	COURSE OUTCOMES	
COMPETITIVE CODING B19 MC 3204	MC 3204.1	Use Mathematical functions to solve coding tasks.
	MC 3204.2	Apply STL functions to solve recursive algorithms.
	MC 3204.3	Solve coding tasks related to selection based problems.
	MC 3204.4	Apply Pattern matching and Graph algorithms to solve various problems.
	MC 3204.5	Use Mathematical functions to solve coding tasks.

**SEMESTER: 7**

**COURSE YEAR: 2022-2023**

**Course Name: (CRYPTOGRAPHY AND NETWORK SECURITY)**

COURSE	COURSE OUTCOMES	
CRYPTOGRAPHY AND NETWORK SECURITY B19 CS 4101	CS 4101.1	Identify Information Security goals, classical encryption techniques and acquire fundamental knowledge on the concepts related to cryptography.
	CS 4101.2	Compare and apply different encryption and decryption techniques to solve problems related to confidentiality.
	CS 4101.3	Apply the knowledge of cryptographic hash functions and Illustrate the performance of different message digest algorithms for verifying the integrity and authentication.
	CS 4101.4	Describe various network security protocols.
	CS 4101.5	Explore the Importance of system security through firewalls and block chain technology.

**Course Name: (MACHINE LEARNING)**

COURSE	COURSE OUTCOMES	
MACHINE LEARNING B19 CS 4102	CS 4102.1	Formulate the concepts of ingredients and preliminaries of machine learning
	CS 4102.2	Apply tree models, linear models and distance based models
	CS 4102.3	Identify and construct features and ensemble models
	CS 4102.4	Demonstrate the concepts of dimensionality reduction techniques, model evaluation and selection techniques
	CS 4102.5	Apply the concepts of artificial neural networks, reinforcement learning

**Course Name: (INTERNET OF THINGS)**

COURSE	COURSE OUTCOMES	
INTERNET OF THINGS B19 CS 4103	CS 4103.1	Compare and contrast various IoT architectures
	CS 4103.2	Identify the <b>open systems interconnection layers</b>
	CS 4103.3	Implement IoT applications using Arduino
	CS 4103.4	Apply various communication protocols in IoT
	CS 4103.5	Analyse data in IoT applications using cloud services

**Course Name: (MOBILE COMPUTING)**

COURSE	COURSE OUTCOMES	
MOBILE COMPUTING B19 PE 4101	PE 4101.1	Discuss fundamental challenges in mobile communications
	PE 4101.2	Demonstrate different Architectures for Mobile communication
	PE 4101.3	Elaborate various IP,TCP protocols for mobile and ad-hoc networks
	PE 4101.4	Illustrate different data delivery methods and synchronization protocols
	PE 4101.5	Identify Wireless local area networks (WLAN) and their protocols

**Course Name: (DATA SCIENCE)**

COURSE	COURSE OUTCOMES	
DATA SCIENCE B19 PE 4101	PE 4101.1	Describe what Data Science is and the skill sets needed to be a data scientist
	PE 4101.2	Illustrate in basic terms what Statistical Inference means. Identify probability distributions
	PE 4101.3	Use R to carry out basic statistical modeling and analysis
	PE 4101.4	Apply basic tools (plots, graphs, summary statistics) to carry out EDA
	PE 4101.5	Describe the Data Science Process and how its components interact

	PE 4101.6	Use APIs and other tools to scrap the Web and collect data
	PE 4101.7	Apply EDA and the Data Science process in a case study

**Course Name: (NO SQL DATA BASES)**

COURSE	COURSE OUTCOMES	
NO SQL DATA BASES B19 PE 4101	PE 4101.1	Identify what type of NoSQL database to implement based on business requirements (key-value, document, full text, graph, etc.)
	PE 4101.2	Apply NoSQL data modeling from application specific queries
	PE 4101.3	Use Atomic Aggregates and denormalization as data modelling techniques to optimize query processing

**Course Name: (DISTRIBUTED SYSTEMS)**

COURSE	COURSE OUTCOMES	
DISTRIBUTED SYSTEMS B19 PE 4101	PE 4101.1	Elucidate the foundations and issues of distributed systems
	PE 4101.2	Illustrate the various synchronization issues and global state for distributed systems
	PE 4101.3	Illustrate the Mutual Exclusion and Deadlock detection algorithms in distributed systems
	PE 4101.4	Describe the agreement protocols and fault tolerance mechanisms in distributed systems
	PE 4101.5	Describe the features of peer-to-peer and distributed shared memory systems

**Course Name: (SOFTWARE PROJECT MANAGEMENT)**

COURSE	COURSE OUTCOMES	
SOFTWARE PROJECT MANAGEMENT B19 PE 4101	PE 4101.1	Apply the process to be followed in the software development life-cycle models.
	PE 4101.2	Apply the concepts of project management & planning.
	PE 4101.3	Implement the project plans through managing people, communications and change
	PE 4101.4	Conduct activities necessary to successfully complete and close the Software projects
	PE 4101.5	Implement communication, modeling, and construction & deployment practices in software development.

**Course Name: (WEB SERVICES)**

COURSE	COURSE OUTCOMES	
WEB SERVICES B19 PE 4102	PE 4102.1	Recite the advantages of using XML technology family
	PE 4102.2	Analyze the problems associated with tightly coupled distributed software architecture
	PE 4102.3	Learn the Web services building block
	PE 4102.4	Implement e-business solutions using XML based web services

**Course Name: (CLOUD COMPUTING)**

COURSE	COURSE OUTCOMES	
CLOUD COMPUTING B19 PE 4102	PE 4102.1	Analyze core concepts and fundamentals of Cloud Computing.
	PE 4102.2	Identify Systems, Protocols, and Mechanisms to support Cloud Infrastructure.
	PE 4102.3	Analyze the Software and Hardware necessities for Cloud Computing, Identify the virtualization and Scheduling algorithms to manage the Cloud Environment.
	PE 4102.4	Analyze issues related to the storage file system, protection and security, and needs for capacity building and training in cloud computing.
	PE 4102.5	Different Application services and hosts on Cloud Environment.

**Course Name: (MEAN STACK TECHNOLOGIES)**

COURSE	COURSE OUTCOMES	
MEAN STACK TECHNOLOGIES B19 PE 4102	PE 4102.1	Enumerate the Basic Concepts of Web & Markup Languages
	PE 4102.2	Develop web Applications using Scripting Languages & Frameworks
	PE 4102.3	Make use of Express JS and Node JS frameworks
	PE 4102.4	Illustrate the uses of web services concepts like restful, react Js
	PE 4102.5	Apply Deployment Techniques & Working with cloud platform

**Course Name: (CYBER SECURITY & FORENSICS)**

COURSE	COURSE OUTCOMES	
CYBER SECURITY & FORENSICS B19 PE 4102	PE 4102.1	Enumerate the computer forensics fundamentals
	PE 4102.2	Describe the types of computer forensics technology
	PE 4102.3	Analyze various computer forensics systems
	PE 4102.4	Illustrate the methods for data recovery, evidence collection and data seizure
	PE 4102.5	Identify the Role of CERT-In Security

**Course Name: (AD-HOC AND SENSOR NETWORKS)**

COURSE	COURSE OUTCOMES	
AD-HOC AND SENSOR NETWORKS B19 PE 4102	PE 4102.1	Evaluate the principles and characteristics of mobile ad hoc networks (MANETs) and what distinguishes them from infrastructure-based networks
	PE 4102.2	Determine the principles and characteristics of wireless sensor networks
	PE 4102.3	Discuss the challenges in designing MAC, routing and transport protocols for wireless ad-hoc sensor networks
	PE 4102.4	Illustrate the various sensor network Platforms, tools and applications
	PE 4102.5	Demonstrate the issues and challenges in security provisioning and also familiar with the mechanisms for implementing security and trust mechanisms in MANETs and WSNs

**Course Name: (MACHINE LEARNING LAB)**

COURSE	COURSE OUTCOMES	
MACHINE LEARNING LAB B19 CS 4104	CS 4104.1	Design Preprocessing model for their own data sets.
	CS 4104.2	Apply dimensional reduction techniques for their own datasets
	CS 4104.3	Develop different clustering & classification techniques
	CS 4104.4	Evaluate the model with Lasso and Ridge Regularization
	CS 4104.5	Design neural network for structured, unstructured data classification and regression

**Course Name: (IPR & PATENTS)**

COURSE	COURSE OUTCOMES	
IPR & PATENTS B19 MC 4101	MC 4101.1	IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents
	MC 4101.2	Student get an insight on Copyrights, Patents and Software patents which are instrumental for further advancements

**SEMESTER: 8****COURSE YEAR: 2022-2023****Course Name: (MANAGEMENT AND ORGANIZATIONAL BEHAVIOR)**

COURSE	COURSE OUTCOMES	
MANAGEMENT AND ORGANIZATIONAL BEHAVIOR B19 HS 4201	HS 4201.1	Explain management functions and principles
	HS 4201.2	Will be able to describe the concepts of functional management that is HRM and Marketing functions
	HS 4201.3	Will be able to get discuss about vision, mission, goal, objective and a strategy based on which the corporate planning depends
	HS 4201.4	The learner is able to recognise strategically contemporary management practices and describe corporate planning process
	HS 4201.5	The learner can discuss about individual behaviour and motivational theories
	HS 4201.6	The student can explain about ways in managing conflicts and stress

**Course Name: (DEEP LEARNING)**

COURSE	COURSE OUTCOMES	
DEEP LEARNING B19 PE 4201	PE 4201.1	Demonstrate the basic concept of Machine learning
	PE 4201.2	Apply the concepts of deep feed forward networks.
	PE 4201.3	Apply the concepts of CNN & RNN models
	PE 4201.4	Explain and apply optimization techniques and auto encoders.

	PE 4201.5	Learn about different DNN models and apply that knowledge to different applications.
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**Course Name: (QUANTUM COMPUTING)**

COURSE	COURSE OUTCOMES	
QUANTUM COMPUTING B19 PE 4201	PE 4201.1	Analyze the behaviour of basic quantum algorithms
	PE 4201.2	Implement simple quantum algorithms and information channels in the quantum circuit model
	PE 4201.3	Simulate a simple quantum error-correcting code
	PE 4201.4	Prove basic facts about quantum information channels

**Course Name: (BLOCK CHAIN TECHNOLOGIES)**

COURSE	COURSE OUTCOMES	
BLOCK CHAIN TECHNOLOGIES B19 PE 4201	PE 4201.1	Analyze the behaviour of basic quantum algorithms
	PE 4201.2	Implement simple quantum algorithms and information channels in the quantum circuit model
	PE 4201.3	Simulate a simple quantum error-correcting code
	PE 4201.4	Prove basic facts about quantum information channels

**Course Name: (BIG DATA ANALYTICS)**

COURSE	COURSE OUTCOMES	
BIG DATA ANALYTICS B19 PE 4201	PE 4201.1	Illustrate big data challenges in different domains including social media, transportation, finance and medicine
	PE 4201.2	Use various techniques for mining data stream
	PE 4201.3	Design and develop Hadoop
	PE 4201.4	Identify the characteristics of datasets and compare the trivial data and big data for various applications
	PE 4201.5	Explore the various search methods and visualization techniques



**Course Name: (DevOps)**

COURSE	COURSE OUTCOMES	
DevOps B19 PE 4201	PE 4201.1	Enumerate the principles of continuous development and deployment, automation of configuration management, inter-team collaboration, and IT service agility
	PE 4201.2	Describe DevOps & DevSecOps methodologies and their key concepts
	PE 4201.3	Illustrate the types of version control systems, continuous integration tools, continuous monitoring tools, and cloud models
	PE 4201.4	Set up complete private infrastructure using version control systems and CI/CD tools

**Course Name: (IoT LAB)**

COURSE	COURSE OUTCOMES	
IoT LAB B19 CS 4202	CS 4202.1	Use sensors, actuators, Arduino and Raspberry pi in IoT applications
	CS 4202.2	Design and Develop various IoT applications.

**Course Name: (Project-II)**

COURSE	COURSE OUTCOMES	
Project-II B19 PR 4201	PR 4201.1	Identify a current problem through literature/field/case studies
	PR 4201.2	Identify the background objectives and methodology for solving the same
	PR 4201.3	Design a technology/ process for solving the problem
	PR 4201.4	Develop a technology/ process for solving the problem.
	PR 4201.5	Evaluate that technology/ process at the laboratory level.