DEPARTMENT OF COMPUTER SCIENCE

Programme: B.Sc., Computer Science

PO No.	Programme Outcomes Upon completion of the B.Sc. Degree Programme, the graduate will be able to
PO-1	emerge with competency in the subject of Computer Science and apply knowledge to cater to the needs of Society / Employer / Institution / Own Business Enterprise
PO-2	imbibe analytical / critical / logical / innovative thinking skills in the field of Science and Technology
PO-3	acquire distinct traits and ethics with high professionalism to gain a broader insight into the domain concerned for nation building
PO-4	work in team to build a system, component, or process to meet the desired needs of IT Industries and other Employment Sectors
PO-5	analyze a problem and use appropriate skills, latest tools, technologies necessary for computing practice

PSO No.	Programme Specific Outcomes Upon completion of these courses the student would
PSO-1	transform and empower women graduates to meet challenges through holistic education in terms of modern Teaching-Learning methodologies
PSO-2	groom the graduates to excel in their career through communication skills and leadership challenges
PSO-3	heighten the conscious of the graduates on socio-economic concern and to evolve it as an inbuilt mechanism to chisel as better human being
PSO-4	train the students on the state-of-the-art tools and techniques and facilitate them to comprehend, analyze, design and create feasible solutions/innovative products for real life problems
PSO-5	make the students socially responsible, compassionate graduates and solution providers with due empathy

Course Title	DATA STRUCTURES AND ALGORITHMS USING C	
CODE	**23CSUC101**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO1	Understand the basic concepts of data structures and algorithms	K1-K2
CO2	Construct and analyze of stack and queue operations with illustrations	K2-K4
CO3	Enhance the knowledge of Linked List and dynamic storage management.	K2-K3
CO4	Demonstrate the concept of trees and its applications.	K2-K3
CO5	Design and implement various sorting and searching algorithms for applications and understand the concept of file organizations.	K1-K4

Course Title	DATA STRUCTURES AND ALGORITHMS USING C LAB	
CODE	**23CSUCP01**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Implement the practical knowledge on the concepts of elementary data structures	K3
CO-2	Implement various types of linked lists and their applications	K3
CO-3	Implement the computational efficiency of the Divide and Conquer Method.	K3
CO-4	Construct programs for tree concepts	K3
CO-5	Implement different sorting and searching algorithms	K3

Course Title	FUNDAMENTALS OF DIGITAL COMPUTERS	
CODE	**23CSUC102**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Acquire knowledge on digital systems and number systems	K2
CO-2	Understand the various types of complements and Binary Codes	K3
CO-3	Interpret Boolean algebra expressions for logic gates and Simplify the Boolean expressions and circuits using Karnaugh Maps	K3
CO-4	Outline the fundamentals of combinational logic design, computer buses, I/O Peripherals and various data transfer techniques	K2
CO-5	Outline the concept of Memory Organization and mapping Techniques	K2

Course Title	MATHEMATICS – I (DISCRETE STRUCTURES)	
CODE	**23CSUA101**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Understand the logical proof and Connectives	K2
CO-2	Understand the concepts of equivalence and implication to formulas of the predicate calculus	K2
CO-3	Demonstrate Relations and Functions and determine the properties of Relations	K2
CO-4	Construct language from a grammar	K3
CO-5	Identify shortest path between two nodes. Classify different types of sets and express the logical relationships between various sets	K3

Course Title	PYTHON PROGRAMMING	
CODE	23CSUC203	
CO No.	Course Outcomes	Knowledge Level
CO-1	Apply decision making, repetition structures and develop functions in Python.	K2
CO-2	Learn to implement various Data Types – Tuple, String, List, Dictionary and Set.	K2
CO-3	Implement classes, objects, file and exception handling mechanisms	K3
CO-4	Learn the concepts of NumPy and Pandas	K3
CO-5	Solve data intensive problems using Python Programming.	K4

Course Title	PYTHON PROGRAMMING LAB	
CODE	23CSUCP02	
CO No.	Course Outcomes	Knowledge Level
CO-1	Implement arithmetic operations, string functions and control structures	K3
CO-2	Apply the concepts of user defined functions	K3
CO-3	Implement the concept of list, dictionary, tuple and sets	K3
CO-4	Implement the concept of OOPs and Exceptions.	K3
CO-5	Develop Programs using NumPy and Pandas.	K3

Course Title	PROBLEM SOLVING TECHNIQUES	
CODE	23CSUC204	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Understand the systematic approach to problem solving.	K1 - K3
CO-2	Know the approach and algorithms to solve specific fundamental problems.	K2 - K4
CO-3	Understand the efficient approach to solve specific factoring-related problems.	K3 - K4
CO-4	Understand the efficient array-related techniques to solve specific problems.	K2 - K4
CO-5	Understand the efficient methods to solve specific problems related to text processing and also to understand how recursion works.	K2 - K3

Course Title	**MATHEMATICS – II (NUMERICAL METHODS AND BIO STATISTICS) (Derivations not included – Problems only)**	
CODE	**23CSUA202**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Identify and Apply the matrix operations for solving any matrix related problems	K1 - K3
CO-2	Determine and apply appropriate numerical methods for solving System of Linear Equations	K2 - K4
CO-3	Compare and distinguish the use of differentiation / integration methods and plan for solving scientific problems.	K3 - K4
CO-4	Analyze and infer the type of data for using measures of location and measures of dispersion.	K2 - K4
CO-5	Recognize and apply the correlation/regression methods for finding the association between the dependent and independent variables.	K2 - K3

Course Title	DATA STRUCTURES AND ALGORITHMS	
CODE	**22CSUC304**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Understand the basic concepts of data structures and algorithms	K1-K2
CO-2	Construct and analyze of stack and queue operations with illustrations	K2-K4
CO-3	Enhance the knowledge of Linked List and dynamic storage management.	K2-K3
CO-4	Demonstrate the concept of trees and its applications.	K2-K3
CO-5	Design and implement various sorting and searching algorithms for applications and understand the conceptof file organizations.	K1-K4

Course Title	OBJECT ORIENTED PROGRAMMING WITH JAVA	
CODE	**22CSUC305**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Demonstrate the concept of object oriented programming through Java	K1, K2
CO-2	Illustrate the syntax and semantics of Java	K2
CO-3	Apply the concept of Inheritance, Modularity, Concurrency, Exceptions handling and data persistence for developing java program	K3
CO-4	Apply the concept of files	K3
CO-5	Understand the fundamental concepts of AWT controls, layouts and events	K1, K2

Course Title	JAVA PROGRAMMING LAB	
CODE	**22CSUCP03**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Demonstrate the creation of objects, classes and methods and the concepts of constructor, methods overloading, Arrays, branching and looping	K2
CO-2	Develop Java programs using Strings, Interfaces and Packages	K3
CO-3	Construct Java programs using Multithreaded Programming and Exception Handling	K3
CO-4	Build Java programs to handle files	K3
CO-5	Create data files Design a page using AWT controls &Mouse Events in Java programming	K3

Course Title	SOFTWARE ENGINEERING	
CODE	**22CSUA303**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Comprehend various software process models	K1
CO-2	Elicit requirements for a software project and develop a Requirement model	K3
CO-3	Apply software engineering principles, techniques, tools and practices	K4
CO-4	Identify and address design and implementation issues to develop a quality software product	K3
CO-5	Study and Compare various software testing approaches	K3

Course Title	RELATIONAL DATABASE MANAGEMENT SYSTEMS	
CODE	**22CSUC406**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Demonstrate the basic elements of RDBMS	K1 – K2
CO-2	Normalize the relational tables.	K1 – K3
CO-3	Develop E-R Model for given problem.	K2 - K4
CO-4	Define and Query the database using SQL Statements.	K1 – K3
CO-5	Apply Advanced SQL statements on relational tables.	K1 – K4

Course Title	WEB PROGRAMMING	
CODE	**22CSUC407**	
CO No.	**Course Outcomes**	**Knowledge Level**
CO-1	Understand the concept of XHTML document and create a basic web page using forms and Tables.	K2
CO-2	Create document with different styles and Identify the positioning of web page elements using Cascading Style Sheets.	K2
CO-3	Understand the basic concepts of JAVA SCRIPT.	K3
CO-4	Describe the concept of Arrays and Functions.	K3
CO-5	Develop applications using Objects and Events.	K3

Course Title	WEB PROGRAMMING LAB	
CODE	22CSUCP04	
CO No.	Course Outcomes	Knowledge Level
CO1	Design and develop their own web page	K2
CO2	Design and develop programs using CSS	K2
CO3	Implement the concept of functions in javascript	K3
CO4	Implement the concept of arrays and strings..	K3
CO5	Develop applications using Events and Objects.	K4

Course Title	CYBER SECURITY AND CYBER LAW	
CODE	22CSUA404	
CO No.	Course Outcomes	Knowledge Level
CO1	Classify hacking, cracking and reconnaissance	K1
CO2	Describe scanning tools and vulnerabilities	K2
CO3	Understand about password cracking and prevention	K2
CO4	Assess the cyber crimes, Session Hijacking	K2
CO5	Practice cyber ethics by learning the Information Technology Act and Indian cyber law	K3

Course Title	OPEN SOURCE TECHNOLOGIES AND PHP	
CODE	21CSUC510	
CO No.	Course Outcomes	Knowledge Level
CO1	Acquire knowledge on open source, principles and Develop the knowledge of different software licenses and their usage.	K2
CO2	Understand the Fundamental Concepts of PHP and its Operators	K2
CO3	Practice the concepts of control structures, string handling and array operations in PHP applications	K2-K3
CO4	Use functions, classes and objects in PHP applications and know about verification and implementation of a form.	K2-K3
CO5	Practice the concepts of File Handling, Sessions, and Cookies. Apply the connectivity between PHP and MySQL database and develop web pages	K4

Course Title	OPERATING SYSTEMS	
CODE	21CSUC409	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the basic concepts of a process and its states.	K1
CO-2	Acquire the knowledge of real storage and virtual storage.	K2
CO-3	Procure the facts of processor scheduling by means of various scheduling algorithms	K2
CO-4	Understand the basic operations on primary and secondary storage disks	K3
CO-5	Get awareness about the functions of a file system. Able to relate UNIX and LINUX operating system	K2

Course Title	PYTHON PROGRAMMING FOR DATA SCIENCE	
CODE	21CSUC512	
CO No.	Course Outcomes	Knowledge Level
CO-1	Apply decision making, repetition structures and develop functions in Python.	K2
CO-2	Learn to implement various Data Types – Tuple, String, List, Dictionary and Set.	K2
CO-3	Implement classes, objects, file and exception handling mechanisms	K3
CO-4	Learn the concepts of NumPy and Pandas	K3
CO-5	Solve data intensive problems using Python Programming.	K4

Course Title	PYTHON PROGRAMMING FOR DATA SCIENCE LAB	
CODE	21CSUCP05	
CO No.	Course Outcomes	Knowledge Level
CO-1	Implement arithmetic operations, string functions and control structures	K3
CO-2	Apply the concepts of user defined functions	K3
CO-3	Implement the concept of list, dictionary, tuple and sets	K3
CO-4	Implement the concept of OOPs and Exceptions.	K3
CO-5	Develop Programs using NumPy and Pandas.	K3

Course Title	CLOUD COMPUTING	
CODE	21CSUE511	
CO No.	Course Outcomes	Knowledge Level
CO-1	Learn basics of Cloud Computing Architecture and its different computing Models	K1
CO-2	Describe the features and characteristics of Virtualization	K2
CO-3	Understand the various security issues and challenges in Cloud Computing	K1
CO-4	Outline the significance of Service Oriented Architecture	K2
CO-5	Compare the concepts of Cloud computing and Mobile Cloud	K2

Course Title	COMPUTER GRAPHICS	
CODE	21CSUE512	
CO No.	Course Outcomes	Knowledge Level
CO-1	Identify the basic attributes of various output primitives	K1
CO-2	Explain about the basic principles of Graphics systems	K2
CO-3	Describe various input techniques and Methods	K2
CO-4	Apply algorithm to draw different mathematicalobjects	K3
CO-5	Illustrate various 2D & 3D Geometric & modeling Techniques	K3

Course Title	COMPUTER NETWORKS	
CODE	21CSUC611	
CO No.	Course Outcomes	Knowledge Level
CO-1	Acquire knowledge on Models of Networks.	K2
CO-2	Understanding the concepts of Physical layer and Data link layer	K3
CO-3	Outline the functionalities of Medium access control protocol and Switching.	K3
CO-4	Learn the Routing algorithms of Network layer and transport layer services.	K3
CO-5	Summarize the elements of application layer protocols and Network security.	K2

Course Title	ANDROID PROGRAMMING	
CODE	21CSUC614	
CO No.	Course Outcomes	Knowledge Level
CO-1	Demonstrate the Android Platform, Architecture and Features	K1 – K2
CO-2	Design User Interface and Develop Activity for Android Applications	K1 – K2
CO-3	Use Indent, Broadcast Receivers and Internet Services in Android Applications	K3
CO-4	Apply Multimedia, Camera and Location Based Services in Android Applications	K3
CO-5	Develop and Implement Database Applications using JSON	K3 – K5

Course Title	ANDROID PROGRAMMING LAB	
CODE	21CSUCP06	
CO No.	Course Outcomes	Knowledge Level
CO-1	Demonstrate the functions of UI components	K2
CO-2	Create User Interfaces for any mobile application	K3-K5
CO-3	Construct Mobile apps incorporating message sending, camera activation, audio playing and google maps features	K3-K5
CO-4	Build Mobile apps with database using SQLite	K3-K5
CO-5	Create simple applications using JSON	K3-K5

Course Title	INTERNET OF THINGS	
CODE	21CSUC613	
CO No.	Course Outcomes	Knowledge Level
CO-1	To understand the basic concepts of IoT, characteristics and enabling technologies	K1
CO-2	To describe conceptual framework of transducers, sensors and actuators	K2
CO-3	To understand the IoT protocols and its domain specifications	K1
CO-4	To demonstrate the design methodology and logical design using python	K2
CO-5	To understand IoT Physical Devices and Endpoints of Arduino Uno and Raspberry Pi	K1

Course Title	Big Data Analytics	
CODE	21CSUE622	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the fundamentals of Bigdata analytics	K2
CO-2	Describe the Hadoop architecture and File system	K2
CO-3	Apply the MapReduce Programming model for real-world problems	K3
CO-4	Explore the concepts of NoSQL databases	K4
CO-5	Develop a complete business data analytics solution	K4

Course Title	ARTIFICIAL INTELLIGENCE	
CODE	21CSUE632	
CO No.	Course Outcomes	Knowledge Level
CO-1	Describe the key components of the artificial intelligence field	K1
CO-2	Describe basic principles of AI in solutions that require problem solving, inference, perception and knowledge representation	K2
CO-3	Define Syntax, Semantics and Inference procedure and Represent knowledge of the world using logic and infer new facts from that Knowledge	K2
CO-4	Understand the procedure and declarative representation of knowledge and programming paradigm for logic	K1
CO-5	Demonstrate the working knowledge in PROLOG in order to write simple PROLOG programs and to implement an AI problem to be solved using prolog	K3