BACHELOR OF COMPUTER APPLICATION (BCA)

PROGRAMME OUTCOMES (PO)

On completion of the Under Graduate programme the student is expected to attain the following learning outcomes

PO No	Graduate Program Outcomes
PO 1	Exhibits understanding of broad business concepts and principles.
PO 2	Identifies and defines problems and opportunities.
PO 3	Gets thorough understanding of nature, scope and application of computer and computer languages.
PO 4	Develops interdisciplinary approach among the students with a strong foundation to pursue post-graduation
PO 5	Gets equipped to meet the industrial requirements and get placed.

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO No	Graduate Program Outcomes
PSO 1	Ability to apply knowledge of mathematics, computer science and management in practice.
PSO 2	Ability to enhance not only comprehensive understanding of the theory but its application in diverse fields.
PSO 3	Prepares young professionals for a range of computer applications, computer organization, techniques of computer networking, software engineering, Web Designing, Cloud Computing, Data Mining and Advance JAVA. .
PSO 4	Competency to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability in multidisciplinary teams with positive attitude.
PSO 5	Ability to communicate effectively.
PSO 6	Enhances programming skills of the young IT professionals through project development in each language/technology learnt during the programme

Semester 1

Name of the Course	Course Outcome
English-I	**CO1** Reading Skills: - Ability to read English with understanding and decipher paragraph patterns, writer techniques and conclusions. **CO2** Writing Skills:- Skill to develop the ability to write structured English and master the mechanics of writing the use of correct punctuation marks and capital letter. **CO3** Listening Skills: - Ability to understand English when it is spoken in various contexts. **CO4** Speaking Skills: - Develops the ability to speak intelligibly using correct tense, word stress, sentence stress and elementary intonation patterns **CO5** Uses English for formal communication effectively.
Mathematics	**CO1** Have substantial experience to comprehend formal logical arguments. **CO2** Becomes skillful in expressing mathematical properties formally via the formal language of propositional logic and predicate logic. **CO3** Be able to specify and manipulate basic mathematical objects such as sets, functions, and relations and will also be able to verify simple mathematical properties that these objects possess. **CO4** Be able to apply basic counting techniques to solve combinatorial problems.
Basic Statistics	**CO1** Skill to choose and apply appropriate numerical methods to obtain approximate solutions to difficult mathematical problems. **CO2** Ability to apply various statistical techniques such as Measures of Central Tendency and Dispersion. **CO3** Understanding of the relationship between variables using the method of Correlation and Trend Fit Analysis. **CO4** Skill to execute programs of various Numerical Methods and Statistical Techniques for solving mathematical problems.

Computer Fundamentals and Digital Principles	**CO1** Bridges the fundamental concepts of computers with the present level of knowledge of the students. **CO2** Familiarized with operating systems, programming languages, peripheral devices, networking, multimedia and internet. **CO3** Understands binary, hexadecimal and octal number systems and their arithmetic. **CO4** Understands how logic circuits and Boolean algebra forms as the basics of digital computer. **CO5** Demonstrates the building up of Sequential and combinational logic from basic gates.
Methodology of Programming and C Language	**CO1** In-depth understanding of algorithm and flow chart and various concepts of C language **CO2** Ability to read, understand and trace the execution of programs. **CO3** Skill to debug a program **CO4** Skill to write program code in C to solve real world problems
Software Lab I	**CO1** Knows concepts in problem solving To do programming in C language **CO2** Understands looping concepts **CO3** Learns to write diversified solutions using C language.

Semester 2

Name of the Course	Course Outcome
English-II	**CO1** Identifies major issues of contemporary significance **CO2** Responds rationally and positively to the issues raised **CO3** Internalize the values imparted through the selected issues of Culture , Identity and Tradition **CO4** Learns to be sensitive towards the victims of man-made atrocities **CO5** Develops a broad vision of Humanity-Realizing the problems of refugeeism.
Discrete Mathematics	**CO1** Develops formal reasoning.

	CO2 Knowledge regarding the use of Discrete Mathematics in Computer Science. **CO3** Ability to communicate knowledge, capabilities and skills related to the computer engineering profession.
Data Base Management Systems	**CO1** Familiarization with Database Management System. **CO2** Comprehensive knowledge of database models. **CO3** Ability to code database transactions using SQL. **CO4** Familiarization with file system and developing effective databases by normalizing. **CO5** Implements database security measures
Computer Organization and Architecture	**CO1** Ability to understand the functionality, organization and implementation of computer system. **CO2** Skill to recognize the instruction codes and formats. **CO3** Knowledge of the internal working of main memory, cache memory, associative memory and various modes of data transfer **CO4** Familiarization with the working of parallel processing and vector processing.
Object oriented programming using C++	**CO1** Familiarization with a widely used programming concept – Object Oriented Programming. **CO2** Develops logical thinking. **CO3** Skill to write codes in C++ by applying concept of OOP, such as Objects, Classes, Constructors, Inheritance etc., to solve mathematical or real world problems **CO4** Learns more about pointers and concepts of polymorphism. **CO5** Ability to isolate and fix common errors in C++ programs.
Software Lab II	**CO1** Applies DDL commands in SQL to create, modify, and remove database objects. **CO2** Applies DML and DCL commands on single and multiple tables. **CO3** Develops solutions for a range of problems using objects and classes.

	CO4 Learns programs to demonstrate the implementation of constructors, destructors and operator overloading. **CO5** Applies fundamental algorithmic problems including type casting, inheritance, and polymorphism.

Semester 3

Name of the Course	Course Outcome
Advanced Statistical Methods	**CO1** Knowledge about different types of distributions. **CO2** Ability to Estimate different distributions **CO3** Knowledge regarding how to conduct hypothesis Testing.
Computer Graphics	**CO1** Knowledge of working of display systems. **CO2** Skill to execute various Scan Conversion algorithms in laboratory so as to draw Graphics primitives. **CO3** Familiarization with 2D and 3D graphics. **CO4** Develops creativity to create 2D objects. **CO5** Ability to implement 2D geometric transformations on computer system.
Microprocessor and PC Hardware	**CO1** Identifies the basic element and functions of 8085 microprocessor. Describes the architecture of 8085 microprocessor. **CO2** Ability to understand different addressing modes and instructions of 8086, design and to develop assembly language programs **CO3** Ability to study the features, function and components of the motherboard. Also the different types of storage devices and its features. **CO4** Understands Hard Disk drive, its operations, disk formatting, components, features, and Hard disk drive installation procedure
Operating Systems	**CO1** Understands the basics of operating system **CO2** Ability to apply CPU scheduling algorithms to manage tasks. **CO3** Learns the process of applying memory management methods and allocation policies.

	CO4 Knowledge of methods of prevention and recovery from a system deadlock **CO5** Gets a thorough knowledge of file allocation and disk allocation
Data Structure using C++	**CO1** Skill to analyze algorithms and to determine algorithm correctness and their time efficiency. **CO2** Knowledge of advanced abstract data type (ADT) and data structures and their implementations. **CO3** Ability to implement algorithms to perform various operations on data structures.
Software Lab III	**CO1** Knowledge about the basic concepts of Function, Array and Link-list. **CO2** Understands how several fundamental algorithms work particularly those concerned with Stack, Queues and Trees. **CO3** Learns to implement various sorting algorithms.

Semester 4

Name of the Course	**Course Outcome**
Operational research	**CO1** Learns to formulate a real-world problem as a mathematical programming model. **CO2** Understands the theoretical workings of the simplex method for linear programming and perform iterations of it by hand **CO3** Understands the relationship between a linear program and its dual, including strong duality and complementary slackness • **CO4** Solves specialized linear programming problems like the transportation and assignment problems.
Design and Analysis of Algorithms	**CO1** Ability to design and analyse the time and space efficiency of the data structure **CO2** Learns algorithms based on divide and conquer method **CO3** Learns to solve problem solving using greedy method **CO4** Learns to solve problems using dynamic programming method **CO5** Implements graph and tree traverse technique to various applications.

System Analysis &Software Engineering	**CO1** Familiarization with the concept of software engineering and its relevance. **CO2** Understands various methods or models for developing a software product. **CO3** Ability to analyse existing system to gather requirements for proposed system. **CO4** Skill to design and code a software.
Linux Administration	**CO1** Learns the fundamental concepts of open-source operating system Linux **CO2** Understands the basic set of commands and editors in Linux operating system. **CO3** Learns shell programming in Linux operating system **CO4** Ability to ddemonstrate the role and responsibilities of a Linux system administrator. **CO5** Ability to ddistinguish various filter and server commands
Web Programming using PHP	**CO1** Ability to develop web pages using HTML and Cascading Style Sheets. **CO2** Ability to Implement dynamic web pages with validation using JavaScript objects by applying different event handling mechanisms. **CO3** Develops simple web application using server side scripting language PHP **CO4** Ability to develop web applications with MySQL.
Software Lab IV	**CO1** Understands the Linux Architecture and command usage **CO2** Learns shell scripting and essential shell programming **CO3** Ability to use HTML CSS and Java script for web designing **CO4** Learns to write simple programs using the server side scripting language PHP. **CO5** Develops database based web applications using PHP and MySQL

Semester 5

Name of the Course	Course Outcome
Computer Networks	**CO1** Learns to explain how communication works in computer networks and to understand the basic terminology of computer networks. **CO2** Ability to explain the role of protocols in networking and to analyses the services and features of the various layers in the protocol stack. **CO3** Understands design issues in Network Security and security threats, security services and mechanisms to counter.
IT and Environment	**CO1** Understands fundamental physical and biological principles that govern natural processes. **CO2** Understands the natural environment as a system and how human activities affect the system **CO3** Ability to interpret environmental resource management and sustainability conflicts from multiple perspectives
Java Programming using Linux	**CO1** Understands principles and practice of object oriented analysis and design in the construction of robust, maintainable programs which satisfy their requirements. **CO2** Solves real world problems using OOP techniques. **CO3** Develops and understands packages, interfaces, exception handling, and multithreaded applications with synchronization. **CO4** Understands the basic principles of creating Java applications with graphical user interface (GUI). **CO5** Ability to apply JDBC to provide a program level interface for communicating with database using java programming.
Open Course - Computer Fundamentals,	**CO1** Ability to know the fundamentals of computer basics and network & communication **CO2** Gets basic knowledge about word processing package

Internet and MS Office	**CO3** Understands spreadsheet package and gets knowledge of advanced idea in Excel **CO4** Learns presentation packages
Software Lab V	**CO1** Identifies classes, objects, members of a class and the relationships among them needed for finding the solution to specific problem **CO2** Learns to Demonstrate how to achieve reusability using inheritance, interfaces and packages and how faster application development can be achieved. **CO3** Learns to demonstrate, understand and use different exception handling mechanisms and concept of multithreading for robust, faster and efficient application development. **CO4** Identifies and describes common abstract user interface components to design GUI in Java using Applet & Swing along with response to events **CO5** Identifies, Designs & develops Java programs using JDBC to connect to MySQL database.
Software development lab I	**CO1** Ability to design and construct a hardware and software system, component, or process to meet desired needs. **CO2** Ability to work on multidisciplinary Problems. **CO3** Capacity to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems.

Semester 6

Course	Course Outcomes
Cloud Computing	**CO1** Articulates the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing **CO2** Identifies the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc. **CO3** Learns to explain the core issues of cloud computing such as security, privacy, and interoperability. **CO4** Learns to choose appropriate technologies, algorithms, and approaches for the related issues. **CO5** Identifies problems, and explains, analyzes, and evaluates various cloud computing solutions.
Mobile Application development- Android	**CO1** Ability to install and configure Android app development tools. **CO2** Ability to write simple GUI applications **CO3** Ability to use built-in widgets and components and to work with the database to store data locally and much more. **CO4** Learns to apply Java programming concepts to Android application development.
Elective-DATA MINING	**CO1** Understands Data Warehouse fundamentals, Data Mining Principles **CO2** Ability to design data warehouse with dimensional modelling and to apply OLAP operations. **CO3** Identifies appropriate data mining algorithms to solve real world problems **CO4** Ability to compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining

	CO5 Capability to describe complex data types with respect to spatial and web mining
Software Lab VI & Seminar	**CO1** Develops skills in presentation and discussion of research topics in a public forum. **CO2** Gives exposure to a variety of research projects and activities in order to enrich the academic experience. **CO3** Ability to experiment on Integrated Development Environment for Android Application Development. **CO4** Ability to design and implement User Interfaces and Layouts of Android App. **CO5** Capacity to design and implement Database Application and Location based services with security features.
Software Development Lab II	**CO1** Makes the student confident in designing an Online Project **CO2** Ability to meet the requirements of the Industry