

**2.6.1 Programme Outcomes (POs) and Course Outcomes (COs) for all Programmes offered by the institution are stated and displayed on website.**

**PO and CO offered by University:-**

<b>Programs</b>	<b>PO</b>	<b>CO</b>
<b>Master of Computer Application (MCA)</b>	<a href="#">Link</a>	<a href="#">Link</a>
<b>Master of Computer Application (Integrated) (MCA-Integrated)</b>	<a href="#">Link</a>	<a href="#">Link</a>
<b>Bachelor of Computer Application (BCA)</b>	<a href="#">Link</a>	<a href="#">Link</a>
<b>Bachelor of Business Administration (BBA)</b>	<a href="#">Link</a>	<a href="#">Link</a>
<b>Bachelor of Management Studies (BMS)</b>	<a href="#">Link</a>	<a href="#">Link</a>

## **PO Offered by University:**

### **Master of Computer Application (MCA)**

- PO1 : Prepare students to become computer professionals with comprehensive knowledge and skills to produce software for emerging requirement.
- PO2 : Prepare students to become continuous learner with aptitude for teaching and research with societal focus.
- PO3: Prepare students who will achieve peer-recognition; as an individual or in a team; through demonstration of good analytical, design and implementation skills.

### **Master of Computer Application (Integrated) (MCA-Integrated)**

- PO1 Apply knowledge of Computing fundamentals, Computing specialization, Mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.
- PO2 Identify, formulates, and solves complex Computing problems reaching substantiated conclusions using fundamental principles of Mathematics, Computing sciences, and relevant domain disciplines.
- PO3 Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- PO4 Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
- PO5 Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.
- PO6 Recognize the need, and have the ability, to engage in independent learning for continual development as a Computing professional.
- PO7 Demonstrate knowledge and understanding of computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO8 Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

### **Bachelor in Computer Application (BCA)**

- PO1: At the end of the program students understand, analyze and develop computer programs in the areas like Web Design, Database manipulation, Windows & Mobile Application.
- PO2: At the end of the program students understand, object-oriented programming features through various programming languages.
- PO3: At the end of the program students are able to create dynamic, Interactive webpage's using various web technologies.
- PO4: At the end of the program students understand the use of structured query language and its syntax, transactions, database recovery and techniques for query optimization.
- PO5: At the end of the program students are able to work in the IT sector as system engineer, software tester, junior programmer, web developer, system administrator, software developer etc.
- PO6: If chosen particular elective at the end of the program students are able to analyze very large data sets in the context of real world problems using various data analytical tools.
- PO7: If chosen particular elective it will help students to develop in depth understanding of the key technologies in AI, data mining & machine learning.

### **Bachelor in Business Administration (BBA)**

- PO1. The Bachelor in Business Administration equips student with an understanding of the competitive environment in which private and a public sector organization operate, and provides student with the analytical and operational skills to resolve business problems in both sectors.
- PO2. The BBA program aims at developing a student's intellectual ability, executive personality and managerial skills through an appropriate blending of business and general education.
- PO3. The program assists the student in understanding and developing the unique leadership qualities required for successfully managing business functions, an organizational unit or an enterprise.

### **Bachelor in Management Studies (BMS)**

- PO1. To provide a basic knowledge of business concepts, procedures and methodologies of operations in organization.
- PO2. To fill full demand for professional managers is increasing day by day, to achieve professional competence.
- PO3. To increase student's capacity to lead Productive and Responsible lives and also bring about open minded tolerant and humanist approach towards each other on the campuses and in the world community.
- PO4. To collaborate with industries and organizations in order to formulate training programs of mutual interest for the benefit of the students.
- PO5. To provide the specific administrative, business, accounting and communication skills required for the practical understanding of the use in the business environment and to introduce analytical and design techniques sufficient for today's business thinking.

## COs for all Programs offered by University

### Master of Computer Application (MCA)

Code	Course Name	Course Outcome
CA-101	Database Management System (DBMS)	<ul style="list-style-type: none"> <li>• Apply the relational model, specify integrity constraints, and explain how to create a relational database using an ER diagram and normalization techniques.</li> <li>• Apply SQL to create, query and manipulate relational databases.</li> <li>• Determine partitioning and distribution of data across networked nodes of a DBMS and data optimization in a distributed environment.</li> </ul>
CA-102	Operating Systems	<ul style="list-style-type: none"> <li>• Analyze design aspects and data structures/policies/algorithms used for file subsystem, memory subsystem, process subsystem and i/o subsystem of Unix OS.</li> <li>• Differentiate between threads and processes and compare different processor scheduling algorithms</li> <li>• Identify the need to create the advance and special purpose operating system.</li> </ul>
CA-103	Fundamentals of Artificial Intelligence	<ul style="list-style-type: none"> <li>• Identify problems that are amenable to solution by AI methods.</li> <li>• Identify appropriate AI methods to solve a given problem.</li> <li>• Design smart system using different informed search / uninformed search or heuristic approaches.</li> </ul>
CA-104 (A)	Computer Programming and Problem Solving	<ul style="list-style-type: none"> <li>• Design blocks of the problems.</li> <li>• Build logic for solving new problems on paper.</li> <li>• Model the logic as code.</li> </ul>
CA-104 (B)	Web Programming	<ul style="list-style-type: none"> <li>• Design the web applications/sites</li> <li>• Apply dynamic paging using Angular JS / JSON / JQuery.</li> <li>• Use JavaScript / Node.JS to make design and scripting.</li> </ul>
: CA-105 (A)	Java Programming (Core Java)	<ul style="list-style-type: none"> <li>• Create Java application development using polymorphism, inheritance, and inner classes.</li> <li>• Develop GUI interface and event driven applications.</li> <li>• Manipulate databases through java application.</li> </ul>
CA-105 (B)	Object Oriented Programming using C++	<ul style="list-style-type: none"> <li>• Understand and use the basic programming constructs of C++ and manipulate various C++ data types, such as arrays, strings, and pointers.</li> <li>• Manage memory appropriately using proper allocation / de-allocation procedures.</li> <li>• Write small-scale C++ programs using the above skills.</li> </ul>
CA LAB - I	LAB on DBMS	<ul style="list-style-type: none"> <li>• Design and implement a database schema for a given problem-domain</li> <li>• Create and maintain tables using PL/SQL, Populate and query a database using SQL DML/DDL commands and programming PL/SQL including stored procedures, stored functions, cursors, triggers.</li> <li>• Application development using PL/SQL &amp; front-end tools.</li> </ul>
CA LAB- II	LAB on OS (Linux)	<ul style="list-style-type: none"> <li>• Implement the Installation of Linux system.</li> <li>• Understand the basic commands of Linux operating system and can write shell scripts.</li> <li>• Implement system administration tasks, installation,</li> </ul>

		configuration and administration of internet servers.
CA LAB-III (A)	LAB on Computer Programming and Problem Solving(COPS)	<ul style="list-style-type: none"> <li>• Construct logic for the problems.</li> <li>• Write algorithms and able to draw logic on paper.</li> <li>• Write code for the logic developed.</li> </ul>
CA LAB-III(B)	LAB on Web Designing	<ul style="list-style-type: none"> <li>• Develop Web site/App.</li> <li>• Use Bootstrap/JavaScript to make design and scripting.</li> <li>• Make Web site dynamic using Angular JS /JSON / JQurey.</li> </ul>
CA LAB-IV(A)	LAB on Java Programming	<ul style="list-style-type: none"> <li>• Write java program using inner classes and static fields in implementation of Java application</li> <li>• Develop Java application for GUI development and event handling.</li> <li>• Develop database application using JDBC.</li> </ul>
CA LAB-IV	LAB on C++ Programming	<ul style="list-style-type: none"> <li>• Develop logic of a program for solving real time problems and isolate and fix common errors in C++ programs</li> <li>• Understand the object-oriented approach for the program development and make use of the OOP concepts (data abstraction, encapsulation, polymorphism, overloading, and inheritance) of C++ appropriately in problem solving.</li> <li>• Create applications using the STL library</li> </ul>
CA-201	Advanced Software Development Methodologies	<ul style="list-style-type: none"> <li>• Apply a thorough understanding of agile principles and specific practices.</li> <li>• Judge, craft and evaluate appropriate adaptations to existing practices or processes depending 24 upon analysis of typical problems.</li> </ul>
CA-202	Mathematical Foundations of Computer Science	<ul style="list-style-type: none"> <li>• Identify, formulate, and develop solutions to computational challenges.</li> <li>• Analyze the behavior of the data, model the data using statistical measures and represent it graphically on paper without using available computerized tools.</li> <li>• Apply mathematical foundations, probability theory in the modeling and design of computational systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.</li> </ul>
CA-203	Data Structures and Algorithms	<ul style="list-style-type: none"> <li>• Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.</li> <li>• Understand data structures such as arrays, linked lists, stacks and queues, graphs, trees and hash tables.</li> <li>• Solve problem involving graphs, trees and apply different sorting and searching algorithms.</li> </ul>
: CA-204 (A)	Machine Learning	<ul style="list-style-type: none"> <li>• Acquire in-depth knowledge of various facets of Machine Learning methods/techniques and algorithms.</li> <li>• Envisage practical application of Machine Learning to Business and Research Computational problems.</li> <li>• Use knowledge of Machine Learning for product/service development.</li> </ul>
CA-204 (B)	Digital Image Processing & Computer Vision	<ul style="list-style-type: none"> <li>• Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics and Digital Image Processing; expose students to MATLAB Image Processing Toolbox.</li> <li>• Demonstrate various algorithms for scan conversion and filling of basic primitives objects and their comparative analysis and applied 2-D and 3-D geometric transformations, viewing and</li> </ul>

		<p>clipping on graphical objects.</p> <ul style="list-style-type: none"> <li>• Use the Mathematics for digital image representation, image acquisition, image transformation, image enhancement and restoration.</li> </ul>
CA-205 (B)	Python Programming	<ul style="list-style-type: none"> <li>• Use lists, tuples, dictionaries, strings and files efficiently for solving real world problems. Implement the concepts of object-oriented programming using python.</li> <li>• Develop modules, packages and GUI based programming for web.</li> </ul>
CA LAB-V	LAB on Advanced Software Development Methodologies	<ul style="list-style-type: none"> <li>• Use GitHub and make repository using Git.</li> <li>• Apply agile software development process.</li> <li>• Develop a project using agile methodology.</li> </ul>
CA Lab-IV	LAB on Data Structures and Algorithms	<ul style="list-style-type: none"> <li>• Develop solutions for a range of problems using procedure oriented / object-oriented programming.</li> <li>• Choose the appropriate data structure and algorithm design method for a specified application.</li> <li>• Apply practical knowledge on the applications of data structures.</li> </ul>
CA LAB-VII (A)	LAB on Machine Learning	<ul style="list-style-type: none"> <li>• Understand the implementation procedures for the machine learning algorithms.</li> <li>• Design Java/Python programs for various Learning algorithms.</li> <li>• Apply appropriate data sets to the Machine Learning algorithms.</li> <li>• Identify and apply Machine Learning algorithms to solve real world problems.</li> </ul>
CA LAB-VII (B)	LAB On Digital Image Processing and Computer Vision	<ul style="list-style-type: none"> <li>• Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics and Digital Image Processing;</li> <li>• Implement various algorithms for scan conversion, filling objects, 2-D and 3-D geometric transformations, viewing and clipping on graphical objects;</li> <li>• Make use of MATLAB and Image Processing Toolbox to implement image transformation, image enhancement in spatial and frequency domain.</li> </ul>
: CA LAB-VIII (A)	LAB on Advanced Java (Technologies)	<ul style="list-style-type: none"> <li>• Step-by-Step procedure for building the project from ground up by using IDE.</li> <li>• Create dynamic web application to utilize the JavaBeans and EJBs reusable components</li> <li>• Create web application using servlets, JSP, Strut and Hibernate technologies.</li> </ul>
CA Lab-V	LAB on Python programming	<ul style="list-style-type: none"> <li>• Demonstrate use and working of various data types, control structures, files, exceptional handling etc.</li> <li>• Create, configure and make use of modules.</li> <li>• Develop console based and GUI applications (both procedural/object oriented) to solve different problems using python programming.</li> </ul>
CA-301	Compiler Construction	<ul style="list-style-type: none"> <li>• Understand the basic structure of compiler, concepts and terminology in programming languages.</li> <li>• Explain lexical analysis, finite state techniques, scanner generator, parsing, kinds of parsers, designing lexical</li> </ul>

		<p>analyzer, scanner and parsers, principal ideas with intermediate code generation, optimizations.</p> <ul style="list-style-type: none"> <li>• Understanding of all concepts is essential to design compiler in general for programming languages.</li> </ul>
CA-302	Design and Analysis of Algorithms	<ul style="list-style-type: none"> <li>• To understand Basics of algorithms, design techniques and analyze the performance.</li> <li>• To learn Searching and traversal algorithms for graphs.</li> <li>• To understand Nondeterministic algorithms and NP class of problem.</li> </ul>
: CA-303	High Performance Computing Paradigms and Applications	<ul style="list-style-type: none"> <li>• Analyze the Cloud computing setup with its vulnerabilities and applications using different architectures.</li> <li>• Design suitable Virtualization concept, Cloud Resource Management.</li> <li>• Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.</li> </ul>
CA-304 (A)	Natural Language Processing	<ul style="list-style-type: none"> <li>• Understand issues and challenges in Natural Language Processing and NLP applications and their relevance in the classical and modern context.</li> <li>• Understand Computational techniques and approaches for solving NLP problems and develop modules for NLP tasks and tools.</li> <li>• Understand various grammar formalisms, which they can apply in different fields of study.</li> </ul>
CA-304 (B)	Artificial Intelligence in Practice with Python	<ul style="list-style-type: none"> <li>• Develop practical AI applications with solid understanding of many new AI techniques.</li> <li>• Implement more complex AI algorithms using Python.</li> <li>• Use AI algorithms to create new real world AI applications.</li> </ul>
CA-304 (C)	Data Analytics	<ul style="list-style-type: none"> <li>• Find a meaningful pattern in data; graphically interpret data.</li> <li>• Implement the analytic algorithms.</li> <li>• Handle large scale analytics projects from various domains; Develop intelligent decision support systems.</li> </ul>
CA-305 (A)	Mobile Application Development (Android Programming)	<ul style="list-style-type: none"> <li>• Compare android with other smartphone OS and desktop OS; Able to understand software stack of android OS.</li> <li>• Understand Activity lifecycle, UI management, use Intent, Broadcast receivers and Internet services.</li> <li>• Effectively use SQLite Database and content providers, multimedia, camera and Location based services in Android Application.</li> </ul>
CA-305 (B)	Microsoft .Net Technologies	<ul style="list-style-type: none"> <li>• Design Web applications / Website using ASP.NET.</li> <li>• Use ASP.NET controls in web applications</li> <li>• Debug and deploy ASP.NET web applications.</li> <li>• Create database driven ASP.NET web applications and web services.</li> </ul>
CA-305 (C)	Ruby on Rails	<ul style="list-style-type: none"> <li>• Understand Ruby Programming language with lexical and syntactic structure of Ruby programs, Data types and Objects, Expressions and Operators, Statements and Control Structures, Methods, pros, lambdas, and closures, Classes and modules, Reflection and Met programming.</li> <li>• Use the Ruby TK (GUI for Ruby).</li> </ul>

		<ul style="list-style-type: none"> <li>• Design web applications using Rails framework</li> </ul>
CA Lab-IX	LAB on Design and Analysis of Algorithms	<ul style="list-style-type: none"> <li>• Construct logic for the algorithms designed using designing techniques.</li> <li>• Posterior analysis of the algorithms.</li> <li>• Debug, test and profile the algorithms, modify to improve performance of the algorithms.</li> </ul>
CA LAB-X	Lab on High Performance Computing Paradigms and Applications	<ul style="list-style-type: none"> <li>• Configure cloud infrastructure.</li> <li>• Monitor load on cloud, balance load by analyzing.</li> <li>• Work with real time cloud solutions.</li> </ul>
CA LAB XI(A)	Lab on Natural Language Processing	<ul style="list-style-type: none"> <li>• Idea about installation and use of NLTK in python.</li> <li>• Understanding of implementation of text files processing operation and Regular Expressions in NLP</li> <li>• Knowledge of implementation of dependency parser, porter stemmer, Morphology, PoS Tagging and other NLP applications</li> </ul>
CA LAB-XI (B)	LAB on AI Practice using Python	<ul style="list-style-type: none"> <li>• Use most common artificial intelligence (AI) use cases in developing AI applications.</li> <li>• Apply various new artificial intelligence techniques in developing AI applications.</li> <li>• Create real-world AI application/s using above AI technique/s.</li> </ul>
CA LAB-XI (C)	Lab on Data Analytics	<ul style="list-style-type: none"> <li>• Develop code using R programming constructs.</li> <li>• Manipulate data using R.</li> <li>• Write code for various data analysis techniques.</li> </ul>
CA LAB-XII (A)	LAB on Android Programming	<ul style="list-style-type: none"> <li>• Design and Implement User Interfaces and Layouts of Android App; Use Intents for activity and broadcasting data in Android App.</li> <li>• Design and Implement Database Application and Content Providers.</li> <li>• Develop Android App with Security features.</li> </ul>
CA LAB-XII (B)	Lab on Microsoft .Net Technologies	<ul style="list-style-type: none"> <li>• Design web site and web applications using ASP.NET</li> <li>• Debug and deploy ASP.NET web applications</li> <li>• Create database driven ASP.NET web applications and web services.</li> </ul>
CA LAB-XII (C)	LAB on Ruby on Rails	<ul style="list-style-type: none"> <li>• Develop program using syntactic structure in ruby.</li> <li>• Build program using APIs of Ruby Programming Language.</li> <li>• Design web applications using Rails framework.</li> </ul>
CA-401	Full Time Industrial Training	<ul style="list-style-type: none"> <li>• Handle specialized technology and update themselves with latest changes in technological world with ability to communicate effectively.</li> <li>• Be multi-skilled IT professional with good technical knowledge, management, leadership and entrepreneurship skills.</li> <li>• Be able to identify, formulate and model problems and find engineering solution based on a systems approach.</li> </ul>



**Master of Computer Application (Integrated) (MCA-Integrated) 2022-23**

<b>Code</b>	<b>Course Name</b>	<b>Course Outcome</b>
CA 1.1	COMPUTER ESSENTIALS	<ul style="list-style-type: none"> <li>• To understand basics of computer System.</li> <li>• To Understand Data Representation and Basic of Algorithm.</li> <li>• To understand concept and functioning of Operating System</li> <li>• To acquire knowledge of Software &amp; Computer Viruses.</li> <li>• To understand Fundamental of Internet &amp; Advanced Application of Computer System in Real Life.</li> </ul>
CA 1.2	Professional Communication	<ul style="list-style-type: none"> <li>• To demonstrates his verbal and non-verbal communication ability</li> <li>• To demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary &amp; Grammar.</li> <li>• To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization.</li> <li>• To draft effective business correspondence with brevity and clarity.</li> <li>• To stimulate their Critical thinking by designing and developing clean and lucid writing skills.</li> </ul>
CA 1.3	Mathematical Foundations in Computer Science-I	<ul style="list-style-type: none"> <li>• Apply mathematical logic to solve problems</li> <li>• Understand sets; apply operations on sets and algebraic structures.</li> <li>• Model and solve real world problems using graphs and trees.</li> <li>• Use mathematical concepts such as relations and functions.</li> <li>• Analyze and understand the mathematical operations on vectors.</li> </ul>
CA 1.4	C Programming	<ul style="list-style-type: none"> <li>• Gain basic knowledge of C language.</li> <li>• Develop logics which will help them to create programs, applications in C programming.</li> <li>• Learn the decision making ability to construct the C Programs.</li> <li>• Apply user defined functions for solving the problem.</li> <li>• Understand the use of structure and union to solve the complex problem.</li> <li>• Analyze problems in different applications and develop logic to implement their solutions</li> </ul>
CA 1.5	Lab on Professional Communication	<ul style="list-style-type: none"> <li>• To demonstrates his verbal and non-verbal communication ability</li> <li>• To demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary &amp; Grammar.</li> <li>• To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization.</li> <li>• To draft effective business correspondence with brevity and clarity.</li> <li>• To stimulate their Critical thinking by designing and developing clean and lucid writing skills.</li> </ul>
CA 1.6	Lab on Problem Solving and Algorithmic Thinking-I	<ul style="list-style-type: none"> <li>• Apply and practice logical ability to solve the problems on matrices.</li> <li>• Apply and practice different operations on sets.</li> <li>• Demonstrate the use of Strings and string handling functions.</li> <li>• Demonstrate the use of graphs and trees.</li> </ul>
CA 1.7	Lab on C programming	<ul style="list-style-type: none"> <li>• Learn Simple C Program.</li> <li>• Read, understand and trace the execution of programs written in C language</li> <li>• Use the decision making ability for writing a C code for a given Problem.</li> </ul>

		<ul style="list-style-type: none"> <li>• Develop details understanding of pointers, functions, string functions, arrays, structure, union and file handling.</li> <li>• Learn to develop complex C Programs.</li> </ul>
CA 2.1	Computer Organization & Architecture	<ul style="list-style-type: none"> <li>• Describe the fundamental organization of a computer system.</li> <li>• Understand the basics of instructions sets and their impact on processor design.</li> <li>• Perform computer arithmetic operations and control unit operations.</li> <li>• Understanding of the addressing modes, instruction formats and program control statements.</li> <li>• Measure the performance of CPU, memory and I/O operations.</li> </ul>
CA 2.2	Web Designing	<ul style="list-style-type: none"> <li>• Design the web Pages using HTML / HTML 5 Tags.</li> <li>• Use Hyperlink, Tables in web page.</li> <li>• Use CSS to apply effect to webpage text / Controls.</li> </ul>
CA 2.3	Mathematical Foundations in Computer Science-II	<ul style="list-style-type: none"> <li>• Solve applications involving permutations and combinations.</li> <li>• Analyze statistical data using measures of central tendency, dispersion and location.</li> <li>• Organize, manage and present data using statistics.</li> <li>• Develop and apply problem-solving techniques needed to accurately calculate probabilities</li> <li>• Provide the students with a fundamental understanding of probabilistic methods</li> </ul>
CA 2.4	C++ Programming	<ul style="list-style-type: none"> <li>• Understand the difference between the top-down and bottom-up approach</li> <li>• Describe the object-oriented programming approach in connection with C++</li> <li>• Apply the concepts of object-oriented programming</li> <li>• Illustrate the process of data file manipulations using C++</li> <li>• Apply virtual and pure virtual function &amp; complex programming situations.</li> </ul>
CA 2.5	Lab on Essentials of Web Designing	<ul style="list-style-type: none"> <li>• Design the web Pages using HTML / HTML 5 Tags.</li> <li>• Use Hyperlink, Tables in web page.</li> <li>• Use CSS to apply effect to webpage text / Controls.</li> </ul>
CA 2.6	Lab on Problem Solving and Algorithmic Thinking-II	<ul style="list-style-type: none"> <li>• Apply and demonstrate the concept of Permutation and Combination.</li> <li>• Apply and demonstrate the measure of Central Tendency</li> <li>• Apply and demonstrate the concepts of probability</li> </ul>
CA 2.7	Lab on C++ Programming	<ul style="list-style-type: none"> <li>• To describe the advantages of a high level language like C++, the programming process, and the compilation process.</li> <li>• To describe and use software tools in the programming process.</li> <li>• To apply good programming principles to the design and implementation of C++ programs.</li> <li>• To design, implement, debug and test programs using the fundamental elements of C++.</li> <li>• To demonstrate an understanding of primitive data types, values, operators and expressions in C++.</li> </ul>
CA 3.1	Operating System	<ul style="list-style-type: none"> <li>• Recall the basic concept of operating system</li> <li>• Summarize fundamental concepts of computer system architecture</li> <li>• Understand the theory of: processes, resource control, physical and virtual memory, scheduling and system calls</li> <li>• Recall the basic concept of memory management, processes and file system</li> <li>• Understand the concept of page replacement algorithms</li> </ul>

		Storage.
CA 3.2	C# Programming Language	<ul style="list-style-type: none"> <li>• Describe the C# language components</li> <li>• Explain Object Oriented Programming In C#</li> <li>• Explain Advanced Features In C# &amp; Exception Handling</li> <li>• Understand the concept of .Net Framework and C# language fundamentals</li> <li>• Develop the console and GUI applications using C# .Net</li> </ul>
CA 3.3	Data Structure & Algorithms	<ul style="list-style-type: none"> <li>• Recall the concept of abstract data types and types of data structures</li> <li>• Apply the different linear data structures like array, stack and queue to various computing problems.</li> <li>• Illustrate the various types of linked list structures with their applications including representations and operations.</li> <li>• Students will be able to develop Linear and Non-Linear data structures such as Trees, Graphs etc.</li> <li>• Students compare various important concepts of sorting and searching techniques</li> </ul>
CA 3.4	Object oriented programming using Java	<ul style="list-style-type: none"> <li>• Summarize Fundamental concepts of object oriented programming using Java technology.</li> <li>• Apply the concepts of Exception handling to develop efficient and error free codes</li> <li>• Analyze the concept of Array, String and Vector.</li> <li>• Justify Why swing component is better than AWT component?</li> </ul>
CA 3.5	Lab on C# programming Language	<ul style="list-style-type: none"> <li>• Demonstrate the concept of boxing and unboxing</li> <li>• Demonstrate the use of Timer control in C#</li> <li>• Demonstrate Simple Database Connectivity using wizard. CO4: Demonstrate a C# application using PictureBox, ScrollBar control</li> <li>• Develop the console and GUI applications using C# .Net</li> </ul>
CA 3.6	Lab on Data Structure & Algorithms	<ul style="list-style-type: none"> <li>• Recall the concept of abstract data types and types of data structures</li> <li>• Apply the different linear data structures like array, stack and queue to various computing problems.</li> <li>• Illustrate the various types of linked list structures with their applications including representations and operations.</li> <li>• Students will be able to develop Linear and Non-Linear data structures such as Trees, Graphs etc.</li> <li>• Students compare various important concepts of sorting and searching techniques</li> </ul>
CA 3.7	Lab on Object oriented programming using Java	<ul style="list-style-type: none"> <li>• To demonstrates his verbal and non-verbal communication ability</li> <li>• To demonstrate his/her ability to write error free while making an optimum use of correct Business Vocabulary &amp; Grammar.</li> <li>• To distinguish among various levels of organizational communication and communication barriers while developing an understanding of Communication as a process in an organization.</li> <li>• To draft effective business correspondence with brevity and clarity.</li> <li>• To stimulate their Critical thinking by designing and developing clean and lucid writing skills.</li> </ul>
CA 4.1	Principals of Management & Accounting	<ul style="list-style-type: none"> <li>• To familiarize the students with the basic Management concept.</li> <li>• To provide a basis of understanding with reference to working of business management.</li> <li>• To develop the foundation in the field of accounting.</li> <li>• To study the fundamental Accounting concepts and terms</li> <li>• To learn the process of recording of financial transactions in the books of Accounts.</li> </ul>

CA 4.2	Data Base Management System	<ul style="list-style-type: none"> <li>• To recall knowledge of fundamentals of DBMS, database design and normal forms</li> <li>• To define various normal forms</li> <li>• To describe basics of SQL for retrieval and management of data</li> <li>• To discuss basics of transaction processing and concurrency control</li> <li>• To Classify database access techniques</li> </ul>
CA 4.3	PHP Programming	<ul style="list-style-type: none"> <li>• Students can define structure and syntax of php</li> <li>• Students can recall arrays</li> <li>• Students can use php function</li> <li>• Students can compare \$_GET and \$_POST</li> </ul>
CA 4.4	Advanced Java	<ul style="list-style-type: none"> <li>• Explain advanced java technology</li> <li>• Apply knowledge of servlet to create server side programs</li> <li>• Evaluate the performance of JSP over servlet</li> <li>• To develop programs using java script and java beans.</li> </ul>
CA 4.5	Lab on DBMS	<ul style="list-style-type: none"> <li>• To recall knowledge of fundamentals of DBMS, database design and normal forms</li> <li>• To define various normal forms</li> <li>• To describe basics of SQL for retrieval and management of data</li> <li>• To discuss basics of transaction processing and concurrency control</li> <li>• To Classify database access techniques</li> </ul>
CA 4.6	Lab on PHP Programming	<ul style="list-style-type: none"> <li>• Students can define structure and syntax of php</li> <li>• Students can recall arrays</li> <li>• Students can use php function</li> <li>• Students can compare \$_GET and \$_POST</li> </ul>
CA 4.7	Lab on Advanced Java	<ul style="list-style-type: none"> <li>• Explain advanced java technology</li> <li>• Apply knowledge of servlet to create server side programs</li> <li>• Evaluate the performance of JSP over servlet</li> <li>• To develop programs using java script and java beans.</li> </ul>
CA 5.1	Computer Networks	<ul style="list-style-type: none"> <li>• To understand the concepts of data communications</li> <li>• To study the functions of different layers.</li> <li>• To understand the different protocols and network components.</li> <li>• Describe the client/server model and key application layer protocols.</li> </ul>
CA 5.2	Design and Analysis of Algorithms	<ul style="list-style-type: none"> <li>• To understand data representation and basic of Algorithm.</li> <li>• To understand concept and functioning and operation of elementary data structures.</li> <li>• Analyze the asymptotic performance of algorithms and write rigorous correctness proofs for algorithms.</li> <li>• Design and analyze divide-and-conquer, greedy and dynamic-programming based algorithms.</li> <li>• Model problems using backtracking, classify nondeterministic polynomial time algorithms</li> </ul>
CA 5.3	Python Programming	<ul style="list-style-type: none"> <li>• Understand the basic concept of Python Programming.</li> <li>• Understand lists, tuples, dictionaries, strings and files efficiently for solving real world problems.</li> <li>• Recall the concepts of object-oriented programming using python.</li> <li>• Understand modules, packages and GUI based programming for web.</li> <li>• Understand the Database connectivity steps.</li> </ul>
CA 5.4	CA 5.4 (A) Web Development Technology-I	<ul style="list-style-type: none"> <li>• To Understand the HTML and CSS features with different layouts as per need of applications.</li> <li>• Describe the concepts of CSS and the requirements of effective web</li> </ul>

		<p>design.</p> <ul style="list-style-type: none"> <li>• Use the JavaScript to develop the dynamic web pages.</li> <li>• Use various React features including components and forms.</li> </ul>
	CA 5.4(B) –Data Analytics I	<ul style="list-style-type: none"> <li>• Understanding the Role of data Analyst.</li> <li>• Understanding the basic concept of data management and data mining techniques.</li> <li>• To understand the basic concept of machine learning</li> <li>• To understand the application of business analysis.</li> <li>• Understanding the basic concept of Advanced Excel.</li> </ul>
	CA-5.4 (C) Computer Graphics	<ul style="list-style-type: none"> <li>• Recall basic concept of computer graphics</li> <li>• Explain the Graphical display Devices &amp; its Application</li> <li>• Apply various scan conversion and filling technique</li> <li>• Explain 2D and 3D transformation and matrix representation technique</li> <li>• Implement various curve representation technique</li> </ul>
CA 5.5	Lab on DAA	<ul style="list-style-type: none"> <li>• Construct logic for the algorithms designed using designing techniques.</li> <li>• Posterior analysis of the algorithms.</li> <li>• Debug, test and profile the algorithms, modify to improve performance of the algorithms.</li> </ul>
CA 5.6	Lab on Python programming Language	<ul style="list-style-type: none"> <li>• Demonstrate use and working of various data types, control structures, files, exceptional handling etc.</li> <li>• Create, configure and make use of modules.</li> <li>• Develop console based and GUI applications (both procedural/object oriented) to solve different problems using python programming.</li> </ul>
CA 5.7	Lab based on Elective I CA 5.7 (A) - Lab On Web Development Technology-I	<ul style="list-style-type: none"> <li>• Create interactive websites using HTML, CSS &amp; JavaScript.</li> <li>• To gain knowledge on designing static and dynamic web pages.</li> <li>• Able to validate web pages at client-side.</li> <li>• Gain knowledge on server side scripting.</li> <li>• Create components, routing and forms validations etc.</li> </ul>
	CA 5.7 (B) – Lab on Data Analytics – I	<ul style="list-style-type: none"> <li>• To develop pivot table and understand the validating &amp; auditing techniques.</li> <li>• To understand different formatting techniques in MS Excel.</li> <li>• To give an overview of the capabilities of popular statistical software packages.</li> <li>• To give hands on experience about the practical approach of Advanced Excel.</li> </ul>
	CA-5.7(C) Lab on Computer Graphics	<ul style="list-style-type: none"> <li>• Apply the algorithms for drawing 2D transformation</li> <li>• Discuss various algorithms for scan conversion and filling</li> <li>• Develop program for 3D transformation</li> <li>• Implement various clipping algorithm</li> <li>• Develop program to create curve using algorithm</li> </ul>
CA 6.1	System Analysis & Designing	<ul style="list-style-type: none"> <li>• Define and use common System Analysis and Design fundamental terminology.</li> <li>• Utilize current Analysis and Design tools to graphically characterize processes and flows in a business system.</li> <li>• Design and create effective Input/output including Web pages/forms.</li> <li>• Design Logical Databases.</li> <li>• Demonstrate the technical and communication skills required for developing a Systems Proposal.</li> </ul>

CA 6.2	Linux Operation System	<ul style="list-style-type: none"> <li>• Understand the history and benefits of Linux.</li> <li>• Navigate and manage the Linux file system.</li> <li>• Create and manage user accounts, groups, and permissions</li> <li>• Use command-line tools for file manipulation and maintenance.</li> <li>• Modify system configuration files and schedule tasks.</li> </ul>
CA 6.3	Asp .Net Programming	<ul style="list-style-type: none"> <li>• Describe different .NET technologies</li> <li>• Explain Web services &amp; HTTP Application</li> <li>• Explain ASP.NET Control and Master Pages</li> <li>• Understand the concept of .Net Framework</li> <li>• Develop the console and GUI applications using ASP .Net</li> </ul>
CA 6.4	CA 6.4 (A) -Web Development Technology-II	<ul style="list-style-type: none"> <li>• To Understand the concept HTML, CSS and JavaScript.</li> <li>• To understand the Angular Forms, inputs, Components and Directives</li> <li>• Demonstrate how to Design Responsive Websites Using Bootstrap.</li> <li>• Understanding of MongoDB and NoSQL data model.</li> <li>• Understanding of MongoDB Architecture and Shell.</li> </ul>
	CA 6.4(B) –Data Analytics II	<ul style="list-style-type: none"> <li>• To introduce the software R and how to write elementary programs</li> <li>• To demonstrate how statistical models are implemented and applied.</li> <li>• To import, manage and structure data files.</li> <li>• To write simple program scripts for data analysis produce illustrative data plots and carry out statistical tests</li> </ul>
	CA-6.4(C) User Interface Designing	<ul style="list-style-type: none"> <li>• Recall the basic concept of HTML and CSS.</li> <li>• To Describe Node JS and traditional web server</li> <li>• To Define control statements including conditionals, loops and arrays</li> <li>• To Describe how to use name and manage node packages</li> </ul>
CA 6.5	Mini Project Development	<ul style="list-style-type: none"> <li>• Students will be able to apply their theoretical knowledge to practical problems and will be able to develop hands on experience in software development.</li> <li>• Students will understand how to apply the programming knowledge for a real world problem.</li> <li>• Students will understand the documentation process regarding the Software Requirements Specification (SRS).</li> </ul>
CA 6.6	Lab on ASP .Net Programming and Linux OS	<ul style="list-style-type: none"> <li>• To Understand the concept of Profiles/Themes using skin files</li> <li>• To Understands using different ASP.Net controls.</li> <li>• To Understand the concept of master page and navigation controls</li> <li>• To Understand the concept of use of ADO .NET</li> <li>• To Understand Linux startup and shutdown procedures.</li> <li>• To Navigate, manage, and maintain the Linux file system.</li> <li>• Configure Linux environment variables and system files.</li> </ul>
CA 6.7	Lab based on Elective II CA 6.7 (A) - Lab on Web Development Technology-II	<ul style="list-style-type: none"> <li>• Develop Angular programs using basic features.</li> <li>• Develop dynamic Web applications using Angular modules</li> <li>• Make use of form validations and controls for interactive applications</li> <li>• Understand the designing library like Bootstrap</li> <li>• Develop highly scalable and cost-efficient applications with MongoDB.</li> </ul>
	CA 6.7 (B) – Lab on Data Analytics – II	<ul style="list-style-type: none"> <li>• To provide basic knowledge of R Syntax.</li> <li>• To provide practical experience of Data analysis using R. CO3: To provide practical insight of using R to calculate descriptive statistics</li> </ul>

	CA-6.7(C) Lab on User Interface Designing	<ul style="list-style-type: none"><li>• Demonstration of hands-on experience on Typescript and Node js.</li><li>• Recall the tag of HTML5 and CSS3</li><li>• To implement Build in Modules and User Define Module in Node Js</li><li>• To Implement Node js with different File System module</li></ul>
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## Bachelor in Computer Application (BCA) (2022-23)

Code	Course Name	Course Outcome
BCA 101	Fundamentals of Accounting	<ul style="list-style-type: none"> <li>To understand fundamental concepts of financial accounting.</li> <li>To understand the basics of cost accounting.</li> <li>To maintain and record financial transactions in books of accounts.</li> <li>To prepare final accounts of sole proprietary business.</li> <li>To prepare Cost Sheet and record the transactions of materials.</li> </ul>
BCA 102	Fundamentals of Computer	<ul style="list-style-type: none"> <li>Acquire the knowledge of fundamentals of Computer and Operating System.</li> <li>Develop problem solving skill through algorithms and flowcharts.</li> <li>Understand the basics of computer networking and internet.</li> </ul>
BCA 103	Programming in C - I	<ul style="list-style-type: none"> <li>Understand the basic concepts of C Programming for problem-solving and illustrate the C data types, syntax and constructs.</li> <li>Illustrate C for decision making, branching and looping statements</li> <li>Understand the concept of Array and Strings to solve different problems.</li> </ul>
BCA 104	Web Design - I	<ul style="list-style-type: none"> <li>Acquainted with elements, Tags and basic structure of HTML files.</li> <li>Up skills the knowledge of basic and advanced web designing.</li> <li>Students were implement effective use of List and Tables.</li> <li>Students were implement effective web page navigation.</li> <li>Students were capable to design web page layout</li> <li>Students were understood and implement use of style sheet.</li> </ul>
BCA 105	Lab on Computer Fundamental	<ul style="list-style-type: none"> <li>Students can able to understand the installation of operating system.</li> <li>Students can understand basic DOS command, and different browser.</li> <li>Student understands different platforms, Internet, mails, tables</li> <li>Students can learn text formatting and table formatting.</li> <li>Students capable to design power point presentation, tables, shapes, smart arts and charts</li> </ul>
BCA 106	Practical on Web Design - I	<ul style="list-style-type: none"> <li>Students were able to design consistent look and feel web pages.</li> <li>Students were capable to use multimedia in web page.</li> <li>Students were implement effective web page navigation.</li> <li>Students were capable to design web page layout</li> <li>Students were implement use of style sheet.</li> </ul>
BCA 107	Lab on C Programming	<ul style="list-style-type: none"> <li>Students understand the input output functions.</li> <li>Students can understand the use of various operators. Students can understand the use of control statements. Students can design the various expressions in C</li> <li>Students can understand the array and its type.</li> </ul>
BCA 201	Professional Communication	<ul style="list-style-type: none"> <li>To develop his verbal and non-verbal communication ability</li> <li>To communicate with people effectively and confidently.</li> <li>To draft effective business correspondence documents.</li> <li>To make and present well designed and informative presentations</li> </ul>
BCA	Database Management System	<ul style="list-style-type: none"> <li>Introduction to the basic concepts of database management</li> </ul>



202		<p>systems. Learning to design databases using ER modeling.</p> <ul style="list-style-type: none"> <li>• Learning to apply integrity constraints.</li> <li>• To understand and demonstrate database schema.</li> <li>• Understand and demonstrate Relational databases, SQL.</li> </ul>
BCA 203	Programming in C – II	<ul style="list-style-type: none"> <li>• Apply the concepts of Function modules, its usage</li> <li>• Apply the concepts of memory allocation using Pointers</li> <li>• Understand the concepts of structures and unions: declaration, initialization and implementation.</li> <li>• Learn to draw different graphics objects.</li> <li>• Learn to store and apply the data using files.</li> </ul>
BCA 204	Web Design - II	<ul style="list-style-type: none"> <li>• Student were able to embed JavaScript in web page</li> <li>• Students successfully added interactivity in web page</li> <li>• Students were applied validation on web form</li> <li>• Students were implemented different events.</li> <li>• Students were familiar with bootstrap framework.</li> </ul>
BCA 205	Lab on DBMS	<ul style="list-style-type: none"> <li>• Students can able to create the database.</li> <li>• Students can understand basic database commands.</li> <li>• Students can understand constraint.</li> <li>• Students capable to design SQL using different clause.</li> </ul>
BCA 206	Lab on C Programming - II	<ul style="list-style-type: none"> <li>• Student was able to understand the concept of Function techniques</li> <li>• Students were able to understand the storage classes</li> <li>• Students were able to understand pointer and its uses.</li> <li>• Students were able to design the basic graphics objects</li> <li>• Students understood the operations on file and command line argument.</li> </ul>
BCA 207	Lab on Web Design - II	<ul style="list-style-type: none"> <li>• Student were able to develop web page using JavaScript</li> <li>• Students successfully added interactivity features in web page</li> <li>• Students were implemented validation on web form</li> <li>• Students were implemented different events.</li> <li>• Students were familiar with bootstrap framework.</li> </ul>
BCA 301	Mathematics and Statistics for Managers	<ul style="list-style-type: none"> <li>• To understanding of all terms related to mathematical logic.</li> <li>• To ability to know the types of sets, method of representation, operations, and laws related to it.</li> <li>• To ability to solve problems related to matrices.</li> <li>• To understand the basic concepts of Statistics.</li> <li>• To analyze statistical data using measures of central tendency.</li> <li>• To performing mathematical and statistical functions using MS-Excel.</li> </ul>
BCA 302	Operating System	<ul style="list-style-type: none"> <li>• To get aware of the main components, computer organization interface, and system calls of OS.</li> <li>• Ability to apply process management and threading.</li> <li>• To Make understand the features of Linux OS</li> <li>• To Learn the basic Linux command</li> </ul>
BCA 303	303 Programming in C++	<ul style="list-style-type: none"> <li>• To Understand OOPs Concept</li> <li>• To Understand the concept to implements Functions, Pointer Array in C++</li> <li>• To Understand to implements Class, Object ,Inheritance and polymorphism</li> <li>• To understand the concepts of Exception handling and File management</li> </ul>

BCA 304 (A)	Web Development Technologies - I	<ul style="list-style-type: none"> <li>• Design Web applications / Website using HTML and PHP.</li> <li>• Use PHP script with functions, Arrays, and Strings in web applications.</li> <li>• Use Forms and Handle Files using PHP Script.</li> <li>• Create web applications using MySQL database</li> </ul>
BCA 304 (B)	Data Analytics-I	<ul style="list-style-type: none"> <li>• Understanding the Role of data Analyst.</li> <li>• Understanding the basic concept of data management and data mining techniques.</li> <li>• To understand the basic concept of machine learning</li> <li>• To understand the application of business analysis.</li> <li>• Understanding the basic concept of Advanced Excel.</li> </ul>
BCA 304 (C)	Python Programming	<ul style="list-style-type: none"> <li>• Explain basic principles of Python programming language</li> <li>• Construct and apply various filters for a specific task.</li> <li>• Apply the best features of mathematics, engineering and natural sciences to program real life problems.</li> </ul>
BCA 305	Lab on Operating System	<ul style="list-style-type: none"> <li>• Apply Linux operating system commands.</li> <li>• Understand different Linux shell scripts and execute various shell programs.</li> </ul>
BCA 306	Lab on C++ Programming	<ul style="list-style-type: none"> <li>• Solve real time problems and isolate and fix common errors in C++ programs.</li> <li>• Understand the object-oriented approach for the program development and make use of the OOP concepts (data abstraction, encapsulation, polymorphism, overloading, and inheritance) of C++ appropriately in problem solving.</li> </ul>
BCA 307 (A)	Lab on Web Development Technologies - I	<ul style="list-style-type: none"> <li>• Design web site / web applications using HTM and PHP script</li> <li>• File and directory handling using PHP for web applications.</li> <li>• Create web application using MySQL database.</li> </ul>
BCA 307 (B)	Lab on Data Analytics - I	<ul style="list-style-type: none"> <li>• To develop pivot table and understand the validating &amp; auditing techniques.</li> <li>• To understand different formatting techniques in MS Excel.</li> <li>• To give an overview of the capabilities of popular statistical software packages.</li> <li>• To give hands on experience about the practical approach of Advanced Excel.</li> </ul>
BCA 307 (C)	Lab on Python Programming	<ul style="list-style-type: none"> <li>• To understand basics of python programming.</li> <li>• To implement different applications using python.</li> </ul>
BCA 401	Software Engineering	<ul style="list-style-type: none"> <li>• To design and develop a software in learned language.</li> <li>• To prepare software requirement specification.</li> <li>• Estimate the size and cost of software product.</li> <li>• Get knowledge of different types of software testing</li> </ul>
BCA 402	Data Structure	<ul style="list-style-type: none"> <li>• To analyses algorithms and algorithm correctness.</li> <li>• To summarize searching and sorting techniques.</li> <li>• To describe stack, queue and linked list operation.</li> <li>• To have knowledge of tree and graphs concepts.</li> </ul>
BCA 403	Java Programming	<ul style="list-style-type: none"> <li>• To apply object oriented programming features and concepts for solving given problem.</li> <li>• Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.</li> <li>• To develop simple interactive applications.</li> </ul>
BCA 404	Web Development Technologies - II	<ul style="list-style-type: none"> <li>• Design Web application / Website using ASP.NET and .NET Framework.</li> </ul>

(A)		<ul style="list-style-type: none"> <li>• Use ASP.NET controls in web applications</li> <li>• Create event driven ASP.NET web application.</li> <li>• State Management for user and application data.</li> <li>• Create web application to manage data from data base using ADO.NET.</li> </ul>
BCA 404 (B)	Data Analytics-II	<ul style="list-style-type: none"> <li>• To introduce the software R and how to write elementary programs</li> <li>• To demonstrate how statistical models are implemented and applied.</li> <li>• To import, manage and structure data files.</li> <li>• To write simple program scripts for data analysis produce illustrative data plots and carry out statistical tests.</li> </ul>
BCA 404 (C)	Artificial Intelligence	<ul style="list-style-type: none"> <li>• Gain a historical perspective of AI and its foundations.</li> <li>• Study the concepts of Artificial Intelligence.</li> <li>• Investigate applications of AI techniques in intelligent agents</li> <li>• Learn the methods of solving problems using Artificial Intelligence.</li> <li>• Learn various peculiar search strategies for AI.</li> </ul>
BCA 405	Lab on Data Structure	<ul style="list-style-type: none"> <li>• Be capable to identify the appropriate data structure for given problem.</li> <li>• Have practical knowledge on the applications of data structures</li> <li>• Analyze the various sorting and searching algorithms.</li> <li>• Apply the different linear data structures like stack, queue and link list to various computing problems.</li> </ul>
BCA 406	Lab on Java Programming	<ul style="list-style-type: none"> <li>• To understand basics of Java Programming.</li> <li>• Implement different applications using Java.</li> </ul>
BCA 407 (A)	Lab on Web Development Technology-II	<ul style="list-style-type: none"> <li>• Use .NET IDE for ASP.NET web application development and form development using standard .NET Controls.</li> <li>• Develop web application handling different events.</li> <li>• Use validation controls for validating page data.</li> <li>• Create and use master page, apply theme and skin for web pages.</li> <li>• Develop web applications using data from database.</li> </ul>
BCA 407 (B)	Lab on Data Analytics-II	<ul style="list-style-type: none"> <li>• To provide basic knowledge of R Syntax.</li> <li>• To provide practical experience of Data analysis using R.</li> <li>• To provide practical insight of using R to calculate descriptive statistics</li> </ul>
BCA 407 (C)	Lab on Artificial Intelligence	<ul style="list-style-type: none"> <li>• Implement different applications in Artificial Intelligence.</li> </ul>
BCA 501	Employability Skills	<ul style="list-style-type: none"> <li>• Understand the significance and importance of developing employability skills for future career success.</li> <li>• Evaluate and analysis of improved personal skills essential for effective workplace performance.</li> <li>• Analyze the effective teamwork and collaboration skills in a professional setting.</li> <li>• Apply ethical standards and professional etiquette in interactions with colleagues and clients.</li> <li>• Understand the necessary skills and knowledge to enter the industry confidently and succeed in chosen field.</li> <li>• Remember, identify and solve problems, make informed decisions, and take appropriate actions in professional settings,</li> </ul>

		thereby developing a well-rounded set of employability skills crucial for future career success.
BCA 502	E-Commerce and M-Commerce	<ul style="list-style-type: none"> <li>Analyse the impact of E-commerce on business models and strategy.</li> <li>Capable to evaluate the effectiveness of e-commerce strategies.</li> <li>Implement marketing strategies for e-commerce businesses.</li> <li>Develop comprehensive E-Commerce strategies for new market</li> </ul>
BCA 503	Cloud Computing Applications	<ul style="list-style-type: none"> <li>Familiar with cloud computing fundamentals, services, implementation, architecture and deployment techniques etc.</li> <li>Capable to understanding about cloud and virtualization.</li> </ul>
BCA 504 (A)	Web Development Technology-III	<ul style="list-style-type: none"> <li>Build a component-based application using Angular components and enhance their functionality using directives.</li> <li>Acquire knowledge about data binding for developing Angular forms and bind them with model data.</li> <li>Apply Angular built-in or custom pipes to format the rendered data.</li> <li>Capable to develop a single page application by using synchronous or asynchronous Angular routing.</li> <li>Capable to make use of MongoDB queries to perform CRUD operations on document database.</li> </ul>
BCA 504 (B)	Data Analytics –III	<ul style="list-style-type: none"> <li>Capable in navigating the Power BI interface, understanding its various components, and knowing how to effectively use them to import, manipulate, and visualize data.</li> <li>Acquire knowledge about Python programming to use for data analytics.</li> <li>Create clear and informative visualizations in Power BI, enabling them to explore and analyze data effectively.</li> <li>Create interactive dashboard using Power BI.</li> </ul>
BCA 504 (C)	Machine Learning	<ul style="list-style-type: none"> <li>Acquire knowledge about understands the basic concept of machine learning</li> <li>Understand the Role of Machine Learning.</li> <li>Apply machine learning algorithms to solve problems of moderate complexity.</li> <li>Apply the algorithms to a real-world problem.</li> </ul>
BCA 505	Lab on E-Commerce	<ul style="list-style-type: none"> <li>Develop technical skills and knowledge about E-Commerce.</li> <li>Analyze both theoretical and practical knowledge of E-Commerce.</li> </ul>
BCA 506	Lab on Cloud Computing	<ul style="list-style-type: none"> <li>Explore important cloud computing driven commercial systems and applications.</li> <li>Analyze various cloud programming models and apply them to solve problems on the cloud.</li> </ul>
BCA 507 (A)	Lab Web Development Technology-III (Angular JS and MongoDB)	<ul style="list-style-type: none"> <li>Build a component-based application using Angular components and enhance their functionality using directives.</li> <li>Utilize data binding for developing Angular forms and bind them with model data.</li> <li>Develop a single page application by using synchronous or asynchronous Angular routing.</li> <li>Make use of MongoDB queries to perform CRUD operations on document database.</li> </ul>
BCA 507 (B)	Lab on Data Analytics –III (Exploratory Data Analytics using Power BI and Python)	<ul style="list-style-type: none"> <li>Acquire knowledge how to import data into Power BI and Python environment.</li> <li>Creating various visualizations in Power BI including histograms, scatter plots, box plots, and others.</li> </ul>

		<ul style="list-style-type: none"> <li>• Design dashboard in Power BI</li> </ul>
BCA 507 (C)	Lab on Machine Learning using Python	<ul style="list-style-type: none"> <li>• Implement the basic application in Machine Learning.</li> <li>• Acquiring knowledge about different function of data distribution.</li> <li>• Understand the concept of regression.</li> </ul>
BCA 601	Entrepreneurship Development	<ul style="list-style-type: none"> <li>• Understand the concept of Entrepreneurship and to learn the professional behavior expected of an entrepreneur.</li> <li>• Acquire conceptual exposure on converting idea to a successful entrepreneurial firm.</li> <li>• Understand on the basic concepts of entrepreneurship and business opportunities to familiars with knowledge about business and project reports for starting a new ventures on team based.</li> </ul>
BCA 602	Cyber Security	<ul style="list-style-type: none"> <li>• Create awareness about cyber security.</li> <li>• Analyze and evaluate existing legal framework and laws on cyber security.</li> <li>• Apply steps of e-commerce and cybercrime prevention.</li> <li>• Develop a deeper understanding with cyber security landscape, cryptography, digital signature, network security etc.</li> <li>• Identify various cybercrime, reporting and investigation procedures.</li> </ul>
BCA 603	Android Application Development	<ul style="list-style-type: none"> <li>• Understand basic and advanced features of android technology.</li> <li>• Designing and building mobile applications using android platform.</li> <li>• Explore the knowledge about storing, sharing and retrieving the data in Android Applications.</li> </ul>
BCA 604 (A)	Web Technology -IV (Web Developments with React.js and Node.js)	<ul style="list-style-type: none"> <li>• Understand the fundamentals of React.js &amp; Node.js web development tools.</li> <li>• Create server-side development using Node JS, focusing on the development of understanding Node JS architectures.</li> <li>• Acquire knowledge about how to connect client-side and server-side applications and showcase effective ways of handling errors and validating inputs.</li> </ul>
BCA 604 (B)	Data Analytics -IV (Data Visualization for Analytics using Tableau)	<ul style="list-style-type: none"> <li>• Explore the concept of data visualization</li> <li>• Understand the principles of effective dashboard design</li> <li>• Develop proficiency in creating interactive dashboards using Tableau</li> <li>• Apply best practices for layout, formatting, and interactivity in dashboard design</li> <li>• Explore advanced dashboard features and techniques in Tableau</li> </ul>
BCA 604 (C)	Data Mining	<ul style="list-style-type: none"> <li>• Understand the different data mining techniques</li> <li>• Acquire knowledge about Data mining concepts</li> <li>• Explore Data mining concepts in different fields.</li> </ul>
BCA 605	Project	<ul style="list-style-type: none"> <li>• Students are able to apply their theoretical knowledge to practical problems and will be able to develop hands on experience in software development.</li> <li>• Understand how to apply the programming knowledge for a real world problem.</li> <li>• Implement the knowledge about Software Requirements Specification (SRS).</li> </ul>
BCA 606	Lab on Android Application Development	<ul style="list-style-type: none"> <li>• Creating robust mobile applications and learn how to integrate them with other services.</li> <li>• Creating intuitive, reliable mobile apps using the android</li> </ul>

		<p>services and components.</p> <ul style="list-style-type: none"> <li>• Create a seamless user interface that works with different mobile screens.</li> </ul>
BCA 607 (A)	Lab on Web Development Technology IV (React Js and Node JS)	<ul style="list-style-type: none"> <li>• Build a component-based application using React JS and Node JS components and enhance their functionality using directives.</li> <li>• Design UI using React JS</li> <li>• Understand server-side development using Node JS, focusing on the development of understanding Node JS architectures.</li> <li>• Understand client-side and server-side applications and showcase effective ways of handling errors and validating inputs.</li> </ul>
BCA 607 (B)	Lab on Data Analytics –IV (Data Visualization using Tableau )	<ul style="list-style-type: none"> <li>• Understand the principles of effective dashboard design</li> <li>• Develop proficiency in creating interactive dashboards using Tableau</li> <li>• Integrate multiple visualizations into cohesive dashboards</li> <li>• Apply best practices for layout, formatting, and interactivity in dashboard design</li> <li>• Explore advanced dashboard features and techniques in Tableau</li> </ul>
BCA 607 (C)	Lab on Data Mining	<ul style="list-style-type: none"> <li>• Implement the basic application in Data Mining.</li> <li>• Understand the clustering using K-means.</li> <li>• Explore the concept of visualization.</li> </ul>

## Bachelor in Business Administration (BBA)

Code	Course Name	Course Objectives
A 1.1	Principles of Management	<ul style="list-style-type: none"> <li>• To provide a basis of understanding to the students with reference to working of business organization through the process of management.</li> <li>• To familiarize the students with the basic Management concept &amp; process</li> </ul>
A 1.2	Principles of Economics	<ul style="list-style-type: none"> <li>• The objective of this subject is to develop a basic understanding about the Principles of Economics.</li> </ul>
A 1.3	Professional Communication-I	<ul style="list-style-type: none"> <li>• To impart the basic communication skills among students.</li> <li>• To improve the English Language Proficiency of the Students.</li> <li>• To develop confidence in Speaking English.</li> </ul>
A 1.4	Fundamentals of Accounting	<ul style="list-style-type: none"> <li>• To study the fundamental Accounting concepts, terms, jargons and learn the process of recording of financial transactions in the books of Accounts.</li> <li>• To develop the foundation for higher studies in the field of accounting.</li> </ul>
A 1.5	Information Technology for Business	<ul style="list-style-type: none"> <li>• The objective of this subject is to develop a basic understanding about the Information technology &amp; its applications.</li> </ul>
A 1.6	Practical on Professional Communication-I	<ul style="list-style-type: none"> <li>• To impart the practical aspects of communication skills among students.</li> <li>• To improve the English Language proficiency of the Student</li> <li>• To develop confidence in Speaking English.</li> </ul>
A 1.7	Practical on Office Automation	<ul style="list-style-type: none"> <li>• To impart practical knowledge &amp; applicability of theoretical concepts with routine examples</li> </ul>
A 2.1	Organizational Behavior	<ul style="list-style-type: none"> <li>• To study Human behavior at work</li> <li>• To get knowledge of Individual &amp; Interpersonal perspectives</li> <li>• To get in depth knowledge of motivation, leadership and organizational change</li> </ul>
A 2.2	Managerial Economics	<ul style="list-style-type: none"> <li>• The objective of this subject is to develop a basic understanding about the Managerial Economics.</li> </ul>
A 2.3	Business Ethics and Corporate Governance	<ul style="list-style-type: none"> <li>• The objective of this subject is to make the students more clear about the importance of ethics in business and practices of good corporate governance.</li> </ul>
A 2.4	Financial Accounting and Costing	<ul style="list-style-type: none"> <li>• To give the practical knowledge of accounting to the students.</li> <li>• To make the students competent in preparation of Accounts for the Business Entities.</li> </ul>

A 2.5	Marketing Management	<ul style="list-style-type: none"> <li>The objective of this subject is to develop a basic understanding about the Marketing Management.</li> </ul>
A 2.6	Practical on Web Designing & Publishing	<ul style="list-style-type: none"> <li>To understand the basics of web designing with the help of small real life examples.</li> </ul>
A 2.7	Practical on Management- "Learning from Business Leaders"	<ul style="list-style-type: none"> <li>To provide an opportunity to the students to 'learn by example' from great leaders belonging to the business world</li> </ul>
A 3.1	Mathematics and Statistics for Managers	<ul style="list-style-type: none"> <li>To impart the required knowledge of Mathematics and statistics for managerial activities among students</li> </ul>
A 3.2	Corporate Accounting & Costing	<ul style="list-style-type: none"> <li>To give the Basic understanding of Corporate Accounting and Costing.</li> <li>To make familiarize with the knowledge of Issue of shares, Redemption of preference shares and redemption of debentures.</li> <li>To understand how to prepare the cost sheet, store ledger and calculation of Material and Labor remuneration.</li> </ul>
A 3.3	Business & Corporate Laws	<ul style="list-style-type: none"> <li>To acquaint the students with the Fundamental Acts of Business Law such as Contract Act, Sales of Goods Act and Negotiable Instruments.</li> <li>To give the knowledge about Incorporation, Procedures, documentation &amp; Management of company</li> </ul>
A 3.4	Management of Small Scale Industries	<ul style="list-style-type: none"> <li>The objective of this subject is to enable the students to understand various aspects in the management of small scale industrial units.</li> </ul>
A 3.5	Management Information System & ERP	<ul style="list-style-type: none"> <li>To create an awareness of the role of information systems in business and to get an introduction to management information system</li> </ul>
A 3.6	Practical on Management of Small Scale Industries	<ul style="list-style-type: none"> <li>The objective of this subject is to enable the students to understand the practical aspects of working in DIC, MIDC and Banks.</li> </ul>
A 3.7	Practical on Advanced Excel	<ul style="list-style-type: none"> <li>To study the formatting and practical applications of Microsoft Office Excel by using different features.</li> </ul>
A 4.1	Business Research Methods	<ul style="list-style-type: none"> <li>To develop a sound conceptual framework for understanding research in management</li> </ul>
A 4.2	Direct and Indirect Taxes in India	<ul style="list-style-type: none"> <li>Awareness about basic concepts of Total Income Tax Calculations</li> <li>Ability to calculate Income from Salary, House Property and Business/Profession.</li> <li>Basic understanding of indirect taxation including VAT (Sales Tax) and Service Tax and recently adopted GST.</li> </ul>
A 4.3	Human Resource Management	<ul style="list-style-type: none"> <li>The course aims to provide inputs to the students regarding importance of HRM and its concepts, principles and various functions.</li> </ul>
A 4.4	Production and Materials Management	<ul style="list-style-type: none"> <li>To develop understanding of production and materials management</li> </ul>
A 4.5	Financial Management	<ul style="list-style-type: none"> <li>To understand the Concept of Financial Management.</li> <li>To enable the students to acquire necessary skills to deal in Financial and Managerial Techniques</li> </ul>



A 4.6	Practical's on Tally ERP	<ul style="list-style-type: none"> <li>To make the student competent in Business Accounting and Preparation of Financial statement in Tally ERP</li> </ul>
A 4.7	Practical's on Tax Base Software	<ul style="list-style-type: none"> <li>To study how to calculate the tax by using Tax Base Software and use it actual business</li> </ul>
A 5.1	International Business Management	<ul style="list-style-type: none"> <li>The objective of this subject is to develop a basic understanding about the International Business Management.</li> </ul>
A 5.2	Entrepreneurship Development	<ul style="list-style-type: none"> <li>To make the student understand the concept &amp; importance of Entrepreneurship and facilitate generation of young entrepreneurs.</li> </ul>
A 5.3	Case Studies in Management	<ul style="list-style-type: none"> <li>To enhance analytical skills of students and to depict thorough knowledge of the subject and develop decision making abilities.</li> <li>To Increase the understanding of what managers should and should not do in guiding a business to success.</li> <li>To identify strategic issues that need to be addressed, evaluating strategic alternatives, and formulating workable plans of action.</li> <li>To gain in-depth exposure to different industries and companies, thereby acquiring something close to actual business experience.</li> </ul>
A 5.4 A	Banking and Insurance	<ul style="list-style-type: none"> <li>To develop the capability of students for knowing banking concepts &amp; operations</li> <li>To give through knowledge of banking operations</li> <li>To introduce the concepts of Life &amp; General Insurance, Transport Travel &amp; Tourism</li> </ul>
A 5.5 A	Capital, Money & Commodity Market	<ul style="list-style-type: none"> <li>The objective of this subject is to develop a basic and working knowledge of the student about Stock Market, Money Market and Commodity Market</li> </ul>
A5.4 C	Recruitment and Selection	<ul style="list-style-type: none"> <li>The objective of this subject is to develop a basic understanding about the Human Resource Planning, Designing Jobs, Recruitment process and Induction of Employees in Human Resources Management.</li> </ul>
A 5.5 C	Industrial Relations	<ul style="list-style-type: none"> <li>The objective of this subject is to develop a basic understanding about the Industrial Relation</li> <li>Know the provisions related the act.</li> <li>Know the laws related to Industrial Disputes and Machinery to resolve it</li> </ul>
A5.6	Practical's on Employability Skills-I	<ul style="list-style-type: none"> <li>To make a final year students capable of obtaining jobs.</li> </ul>
A5.7	Practical's based on e-Commerce	<ul style="list-style-type: none"> <li>To make acquainted the students with Indian e-Commerce industry.</li> </ul>
A6.1	Management of Services	<ul style="list-style-type: none"> <li>The objective of this subject is to develop a basic understanding about Management of Services.</li> </ul>
A6.2	Family Business Management	<ul style="list-style-type: none"> <li>Develop a working knowledge in addressing concerns in management, governance and relational dynamics in family firms.</li> </ul>

A6.3	Cyber Security & Laws	<ul style="list-style-type: none"> <li>• To introduce the student with information security, security threats and control</li> <li>• To study and understand the basic concepts of cryptography, network security and cyber laws.</li> </ul>
A6.4(A)	Auditing Practices	<ul style="list-style-type: none"> <li>• To study the various concept of Audit, Auditing Techniques and tools to the students.</li> <li>• To understand the compliance requirement of Auditing &amp; Assurance Standards.</li> <li>• To study Auditing procedure of company &amp; other entities and understand the importance of Audit Report.</li> </ul>
A6.5 (A)	Investment Banking	<ul style="list-style-type: none"> <li>• To develop the basic and working level knowledge of the students regarding stock market in India and across the world.</li> <li>• To provide the knowledge about Issues of Shares , Mechanism and also about Financial and trading Institutions and regulatory body in Stock Market ,Stock Market History in World and In India</li> </ul>
A6.4(C)	Training and Development	<ul style="list-style-type: none"> <li>• The objective of this subject is to develop a basic understanding about the Training and Development in Human Resources Management.</li> </ul>
A6.5(C)	Performance Management	<ul style="list-style-type: none"> <li>• The objective of this subject is to develop a basic understanding about the Performance Management of Employees in Human Resources Management.</li> </ul>
A6.6	Practical on Employability Skills-II	<ul style="list-style-type: none"> <li>• To make a final year students capable of obtaining jobs.</li> </ul>
A6.7	Project Report based on elective	<ul style="list-style-type: none"> <li>• To enhance analytical skills of students and to depict thorough knowledge of the domain subject and develop decision making abilities through study of various types of issues that need to be addressed, evaluating strategic alternatives and formulating remedial plans of action as recommendations.</li> <li>• To Increase the understanding of what managers should and should not do in guiding a business to success</li> </ul>

## Bachelor in Management Studies (BMS)

SEM	Subject Name	Course Objective
M 1.1	Principles of Management - I	<ul style="list-style-type: none"> <li>To Understanding various concepts of Management</li> </ul>
M 1.2	Communication Skill - I	<ul style="list-style-type: none"> <li>To impart the basic communication skills among students.</li> <li>To improve the English Language Proficiency of the Students.</li> <li>To develop confidence in Speaking English.</li> </ul>
M 1.3	Microeconomics	<ul style="list-style-type: none"> <li>To study various basic economics concepts.</li> </ul>
M 1.4	Fundamentals of Accounting	<ul style="list-style-type: none"> <li>To study the fundamental Accounting concepts, terms, jargons and learn the process of recording of financial transactions in the books of Accounts.</li> <li>To develop the foundation for higher studies in the field of accounting.</li> </ul>
M 1.5	Introduction to Marketing	<ul style="list-style-type: none"> <li>To study and understand the basic concepts of marketing, marketing mix and market segmentation.</li> <li>To apply knowledge of the key marketing concepts to business situations.</li> <li>To study and understand the new trends of marketing.</li> </ul>
M 1.6	Fundamentals of Computer	<ul style="list-style-type: none"> <li>To make students well familiar with computer concepts and Office automation tools.</li> </ul>
M 1.7	Practical on ICT practices	<ul style="list-style-type: none"> <li>To understand basic term of Information Technology.</li> <li>To Impart Practical Training on using Internet based applications.</li> </ul>
M 2.1	Principles of Management – II	<ul style="list-style-type: none"> <li>To Understanding advance concepts of Management.</li> </ul>
M 2.2	Communication Skill – II	<ul style="list-style-type: none"> <li>To impart the basic communication skills among students.</li> <li>To improve the English Language Proficiency of the Students.</li> <li>To develop confidence in Speaking English.</li> </ul>
M 2.3	Macroeconomics	<ul style="list-style-type: none"> <li>To develop basic understanding about macroeconomics, consumption, investment, inflation and deflation, monetary policy, fiscal policy and Business cycle</li> </ul>
M 2.4	Financial Accounting	<ul style="list-style-type: none"> <li>To give practical knowledge of accounting to the students.</li> <li>To make the students competent in preparation of Accounts for the Business Entities.</li> </ul>
M 2.5	Organization Behavior	<ul style="list-style-type: none"> <li>To prepare students in understanding various traits of Organization Behavior.</li> </ul>
M 2.6	e-commerce & M-Commerce	<ul style="list-style-type: none"> <li>To understand the basics of electronic commerce and Mobile Commerce.</li> </ul>
M 2.7	Practical on Office Automation	<ul style="list-style-type: none"> <li>To understand terms and familiar with MS-Office suite.</li> </ul>
M 3.1	Mathematics for Management	<ul style="list-style-type: none"> <li>To impart the required knowledge of Mathematics for managerial activities among students.</li> </ul>

M 3.6	CRM & Digital Marketing	<ul style="list-style-type: none"> <li>• To aware the students with the concepts of customer relationship management and digital marketing</li> </ul>
M 4.1	Business Statistics	<ul style="list-style-type: none"> <li>• To impart the required knowledge of statistics for managerial activities among students.</li> </ul>
M 4.2	Human Resource Management	<ul style="list-style-type: none"> <li>• The course aims to provide inputs to the students regarding basic concepts of HRM and its importance and functions.</li> </ul>
M 4.7	Practical on Taxation software	<ul style="list-style-type: none"> <li>• To study how to calculate the tax by using Tax base software.</li> </ul>
M 5.1	Management Information System	<ul style="list-style-type: none"> <li>• To develop the knowledge about process of MIS and its application to the business for decision making process</li> </ul>
M 5.3	Cyber Law & Security	<ul style="list-style-type: none"> <li>• To introduce the student with information security, security threats and control. • To study and understand the basic concepts of cryptography, network security and cyber laws.</li> </ul>