Anekant Education Society's

Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati

SYLLABUS STRUCTURE OF

Bachelor of Business Administration (Computer Application)

FYBBA(C.A) (2019pattern)

Syllabus (CBCS Pattern) under Academic Autonomy for the year 2019-2020

Semester – I (w. e. f. A.Y. 2019-2020)

Subject Code	Name of Subject	Marks			Credit
		Int.	Ext.	Total	
BCA1101	Logic in Computer Science	40	60	100	3
BCA1102	Data Structure and Algorithm	40	60	100	3
BCA1103	Business Accounting	40	60	100	3
BCA1104	Business Communication	40	60	100	3
BCA1105	Principles and Practices of Management and Organizational Behavior	40	60	100	3
BCA1106	Practical Lab-I [Based on Paper 1102 & 1103]	40	60	100	3
	Physical Education	-	-	-	2
Total		**300**	**300**	**600**	**20**

Semester – II (w. e. f. A.Y. 2019-2020)

Subject Code	Name of Subject	Marks			Credit
		Int.	Ext.	Total	
BCA1201	Object Oriented Programming using C++	40	60	100	3
BCA1202	Database Management System	40	60	100	3
BCA1203	Software Engineering	40	60	100	3
BCA1204	Technical Report Writing	40	60	100	3
BCA1205	Business Commerce	40	60	100	3
BCA1206	Practical Lab-II [Based on Paper 1201 ,1202]	40	60	100	3
	Certificate Course	-	-	-	2
Total		**300**	**300**	**600**	**20**

Class: F.Y.BBA (C.A.) (Semester - I)

Paper Code: BCA1101

Title of Paper: Logic in Computer Science

Course Outcome:

By the end of the course, students will be able to:

CO1. Understanding formal logic helps students develop a structured approach to problem-solving. It enables them to break down complex problems into smaller, more manageable components.

CO2. Fundamental concepts in propositional, predicate and temporal logic and apply resolution techniques.

CO3. Students should able to apply the concept of program verification in real-world scenarios.

CO4. Specify properties of a reactive system using linear-time temporal logic and branching time temporal logic

CO5. Judge the relevance of logical reasoning in computer science, i.e. for Modelling compute Systems.

CO6. Analyze the applicability of logical tools to solve problems in computer science, i.e. finding bugs with the use of model checking

CO7. The ability to reason logically is crucial for verifying the correctness of programs. This includes identifying and fixing logical errors in code.

Class: F.Y.BBA (C.A.) (Semester - I)

Paper Code: BCA1102

Title of Paper: Data Structure and Algorithm

Course Outcome:

By the end of the course, students will be able to:

CO1. Define data structures like array, stack, queues and linked list.

CO2. Explain insertion, deletion and traversing operations on data structures

CO3. Identify the asymptotic notations to find the complexity of an algorithm.

CO4. Compare various searching and sorting techniques.

CO5. Choose appropriate data structure while designing the algorithm.

CO6. Design advance data structures using nonlinear data structures.

CO7. Develop programming skills which require to solve given problem

Class: F.Y.BBA (C.A.) (Semester - I)
Paper Code: BCA1103
Title of Paper: Business Accounting

Course outcomes:

By the end of the course, students will be able to:

- **CO1.** Define book-keeping and accounting.
- **CO2.** Explain the differences between management and financial accounting.
- **CO3.** Describe the main elements of financial accounting information – assets, liabilities, revenue and expenses.
- **CO4.** Identify and interpret accounting information to inform users and make decisions.
- **CO5.** Apply critical thinking skills by identifying and analyzing accounting issues using relevant accounting frameworks.
- **CO6.** Analyze financial and contextual information to make decisions, estimate costs and determine tax implications, audit risk, and engagement procedures.
- **CO7.** Students will recognize commonly used financial statements, their components how information from business transactions flows into these statements

Class: F.Y.BBA (C.A.) (Semester - I)

Paper Code: BCA1104

Title of Paper: Business Communication 48

Course outcomes:
By the end of the course, students will be able to

- **CO1.** Communicate effectively in real life situation.
- **CO2.** Demonstrate the use of basic and advanced business writing skills.
- **CO3.** Produce clear and concise written business documents.
- **CO4.** Develop interpersonal communications skills that are required for social and business interaction.
- **CO5.** Plan and conduct effective meetings.
- **CO6.** Employ proper public speaking techniques.
- **CO7.** Develop and deliver a formal presentation...

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Class: F.Y.BBA (C.A.) (Semester - I)

Paper Code: BCA1105

Title of Paper: Principles and Practices of Management and Organizational Behavior

Course Outcomes:

By the end of the course, students will be able to

CO1. Develop skills to manage work-related stress.
CO2. Analyze the interactions between multiple aspects of management.
CO3. Justify the role of leadership qualities.
CO4. Analyze the role of planning and decision making.
CO5. Utilize interpersonal communication and conflict management effectively in diverse organizational setting
CO6. Analyze how teams and groups act as supportive functions within organizational structures.
CO7. Identify fundamental concepts and principles for managing organizations and employees.

Class: F.Y.BBA (C.A.) (Semester - I)

Paper Code: BCA1106

Title of Paper: Practical Lab-I

Course Outcomes:

By the end of the course, students will be able to

CO1. Implement linear and nonlinear data structures using linked list.
CO2. Apply various data structures such as stack, queue and tree to solve the problems.
CO3. Implement various searching and sorting techniques.
CO4. Analyze the complexity of the algorithms.
CO5. Choose appropriate data structure while designing the applications, variables, identifiers, operators, type conversion and other building blocks of C Language.
CO6. Design programs for solving problems using different data structures.
CO7. Implement basic data structures and applications. Also learn about the application of computers in accounting.

Class: F.Y.BBA (C.A.) (Semester - II)

Paper Code: BCA1201

Title of Paper: Object Oriented Programming using C++

Course Outcome:

By the end of the course, students will be able to

- **CO1.** Explain the basic concepts of object oriented programming language and their representation.
- **CO2.** Illustrate dynamic memory allocation functions, access specifiers and the friend functions.
- **CO3.** Demonstrate the use of constructors, destructors and also the behavior of inheritance and its implementation.
- **CO4.** Implement polymorphism and overloading of operators.
- **CO5.** Apply the I/O operations to handle backup system using files and to develop general purpose templates.
- **CO6.** Handle raised exception while implementing various object oriented concepts.
- **CO7.** Develop an application using the concepts of OOPS and associated concepts for complex problem.

Class: F.Y.BBA (C.A.) (Semester - II)

Paper Code: BCA1202

Title of Paper: Database Management system

Course outcomes:

By the end of the course, students will be able to

- **CO1.** Understand the fundamental concepts of database, relation, relational models and algebra, SQL, and normalization algorithms.
- **CO2.** Construct an Entity-Relationship (E-R) model from specification and transform it to a relational model.
- **CO3.** Analyze the principle input and output parameters of DBMS as applicable to database manipulation strategies.
- **CO4.** Construct queries in SQL or relational Algebra to perform CURD (Create Update, Retrieve and Delete) operations on database.
- **CO5.** Evaluate the correctness of the chosen normalization in terms of its effectiveness to solve a problem under investigation.
- **CO6.** Apply the principles of database transaction management, database recovery and security.
- **CO7.** Analyze the core terms, concepts, and tools of relational database management system.

Class: F.Y.BBA (C.A.) (Semester - II)

Paper Code: BCA1203

Title of Paper: Software Engineering

Course Outcomes:

By the end of the course, students will be able to

- **CO1.** Acquire the knowledge about fundamental concepts of software engineering, process models, modern engineering tools used in software development and few Software Testing techniques.
- **CO2.** Decompose the given project in various phases of a lifecycle.
- **CO3.** Analyze the suitability of chosen model using different UML diagrams for a given problem.
- **CO4.** Perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance
- **CO5.** Assess the errors in the designed model for free application using suitable testing techniques
- **CO6.** Evaluate Software engineering concepts and skills in the real world problem scenario independently.CO7.
- **CO7.** Apply the knowledge, techniques, and skills in the development of a software product

Class: F.Y.BBA (C.A.) (Semester - II)

Paper Code: BCA1204

Title of Paper: Technical Report Writing

Course Outcomes:

By the end of the course, students will be able to

- **CO1.** Produce a documentation plan, including estimates and schedules
- **CO2.** Design and structure a document by analyzing the readership and selecting the right information
- **CO3.** Students will learn to write technical reports that serve the purpose of providing clearly understandable information for readers
- **CO4.** Students will also learn and apply easy writing techniques that will reduce their report writing time and will improve the quality of their writing.
- **CO5.** Participate actively in writing activities that model effective and technical communication in the workplace
- **CO6.** Develop professional work habits, including those necessary for effective collaboration and cooperation with other students, instructors, and service learning contact representatives.
- **CO7.** Identify the scope, need and purpose of various types of data.

Class: F.Y.BBA (C.A.) (Semester - II)

Paper Code: BCA1205

Title of Paper: Business Commerce

Course Outcomes:

By the end of the course, students will be able to

- **CO1.** Gain an understanding on how innovative use of the Business Commerce can help developing competitive advantages.
- **CO2.** Understand the basics of E-commerce, current and emerging business models.
- **CO3.** Familiarize with basic business operations such as sales, marketing, HR etc. on the web.
- **CO4.** Enhance the students' skills for designing and developing website.
- **CO5.** Identify the emerging modes of e-payment.
- **CO6.** Understand the importance of security, privacy, ethical and legal issues of e-commerce.
- **CO7.** Understand the implementation of Electronic Data Interchange (EID) in day to day life.

Class: F.Y.BBA (C.A.) (Semester - II)

Paper Code: BCA1206

Title of Paper: Practical Lab- II

Course Outcomes:

By the end of the course, students will be able to

- **CO1.** Implement object oriented concepts such as objects, class abstraction and message passing.
- **CO2.** Implement the friend function and function overloading , operator overloading, Inheritance and method overriding.
- **CO3.** Implement virtual function to achieve Run time polymorphism, various functions on String and I/O operation to handle file system.
- **CO4.** illustrate the basic DDL commands, DCL and DML commands.
- **CO5.** Demonstrate SQL queries using SQL operators and explain the concept of relational algebra.
- **CO6.** Implement various queries using date and group functions and elaborate nested queries.
- **CO7.** Construct views, cursor and triggers.

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SYLLABUS STRUCTURE OF

Bachelor of Business Administration (Computer Application)Syllabus

(CBCS Pattern) under Academic Autonomy for the year 2020-2021

S.Y.BBA (CA) (2019 Pattern)

Semester –III (w. e. f. A.Y. 2020-2021)

Subject Code	Name of Subject	Marks			Credit
		Int.	Ext.	Total	
BCA2301	Java Programming	40	60	100	03
BCA2302	Web Technologies	40	60	100	03
BCA2303	Python Programming	40	60	100	03
BCA2304	Operating System	40	60	100	03
BCA2305	Business Statistics using R Programming	40	60	100	03
BCA2306	Computer Laboratory based on (BCA2301, BCA2302)	40	60	100	02
BCA2307	Computer Laboratory based on (BCA2303, BCA2305)	40	60	100	02
Certificate Course		-	-	-	02
Environmental Study (EVS)		-	-	-	02
Total		**280**	**420**	**700**	**23**

Semester –IV (w. e. f. A.Y. 2020-2021)

Subject Code	Name of Subject	Marks			Credit
		Int.	Ext.	Total	
BCA2401	Advanced Java Programming	40	60	100	03
BCA2402	Advanced Web Technologies	40	60	100	03
BCA2403	Mathematical Foundation for Data Science	40	60	100	03
BCA2404	Software Testing and Quality Assurance	40	60	100	03
BCA2405	Networking	40	60	100	03
BCA2406	Computer Laboratory based on (BCA2401 and BCA2402)	40	60	100	02
BCA2407	Computer Laboratory based on (BCA2404 and BCA2405)	40	60	100	02
PR-22	Project	-	-	-	04
Total		**280**	**420**	**700**	**23**

Class : S.Y.BBA (C.A.) (Semester - III)

Paper Code : BCA2301

Title of Paper : Java Programming

Course Outcomes:

By the end of the course, students will be able to:

CO1. Know the different basic concepts of Java programming language.
CO2. Use the Java programming use various programming technologies
CO3. Able to understand the use of abstract classes
CO4. Able to solve problems using java collection framework and I/o classes.
CO5. Able to develop multithreaded applications with synchronization.
CO6. Able to develop applets for web applications.
CO7. Develop software in the Java programming language.

Class : S.Y.BBA (C.A.) (Semester - III)

Paper Code : BCA2302

Title of Paper : Web Technologies

Course Outcome:

By the end of the course, students will be able to:

CO1. Apply critical thinking skills to analyze and solve complex problems in web development.
CO2. Communicate effectively through written and oral means, demonstrating the ability to document and present web development projects.
CO3. Students should be able to create responsive web designs.
CO4. Students should be able to comprehend the basic concepts of the World Wide Web, Including the client-server architecture, protocols (HTTP/HTTPS), and the role of web browsers.
CO5. Understand the basic syntax, data types, and control structures of JavaScript.
CO6. Implement smooth transitions and animations using CSS properties, enhancing user experience.
CO7. Create dynamic and visually appealing user interfaces using jQuery for animations, fades, slides, and other effects.

Class : S.Y.BBA (C.A.) (Semester - III)**Paper**

Code : BCA2303

Title of Paper : Python Programming

Course Outcomes:

By the end of the course, students will be able to:

CO1. Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.

CO2. Design and develop Python applications.

CO3. Design and implement functions for code modularity, reusability, and maintainability.

CO4. Apply principles of OOP, including classes, objects, inheritance, encapsulation, and polymorphism, in Python programming.

CO5. Demonstrate proficiency in using and manipulating common data structures in Python, such as lists, dictionaries, tuples, and sets.

CO6. Understand and apply OOP principles, including classes, objects, inheritance, encapsulation, and polymorphism.

CO7. Develop, run and manipulate Python programs using Core data structures like Lists, Dictionaries, and use of Strings Handling methods.

Class : S.Y.BBA (C.A.) (Semester - III)

Paper Code : BCA2403

Title of Paper **:** Operating System

Course Outcomes:

By the end of the course, students will be able to:

CO1. Control access to a computer and the files that may be shared.

CO2. Demonstrate the knowledge of the components of computer and their respective roles in computing.

CO3. Ability to recognize and resolve user problems with standard operating environments

CO4. Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use effectively.

CO5. Identify different types of disk scheduling algorithms.

CO6. Understand the concepts of secondary storage structure, protection and case study of Linux operating system.

Class : S.Y.BBA (C.A.) (Semester – III)

Paper Code : BCA2305

Title of Paper: Business Statistics using R Programming

Course Outcomes:

By the end of the course, students will be able to:

CO1. Develop proficiency in using statistical tools and software..
CO2. Apply mathematical and statistical techniques to analyze and interpret data.
CO3. Apply knowledge of mathematics and statistics to solve real-world problems.
CO4. Demonstrate programming skills and the ability to use appropriate tools for statistical analysis.
CO5. Communicate effectively using graphical and numerical representations.
CO6. Apply statistical principles and methods to design experiments and analyze data.
CO7. Understand and apply probability concepts in statistical analysis.

Class : S.Y.BBA (C.A.) (Semester - III)

Paper Code: BCA2306

Title of Paper: Computer Laboratory (Based on BCA2301 & UBCA2302)

Course Outcomes:

By the end of the course, students will be able to:

CO1: Develop proficiency in programming languages and tools.
CO2: Apply JDBC techniques to analyze and interpret data.
CO3: Apply knowledge of Servlet Programming and JSP to solve real-world problems.
CO4: Demonstrate programming skills and the ability to use appropriate tools for Software development.
CO5: Communicate effectively using appropriate tools and technologies.
CO6: Apply Web Services and Programming Interfaces and methods to design experiments and analyze data.
CO7: Understand and apply ethical principles in data management and software development.

Class : S.Y.BBA (C.A.) (Semester III)

Paper Code: BCA2307

Title of Paper: Computer Laboratory (Based on BCA2303 & BCA2305)

Course Outcomes-

By the end of the course, students will be able to:

CO1. Identify Appropriate Data Types, Control Statements.

CO2. Demonstrate programming skills using String, List, Tuple, Dictionary, Set for Python Programming.

CO3. Write programs using Modules in Python Programming.

CO4. Get familiar with R-Software and Learn basics of R-Programming

CO5. Understand the Basics in R-Programming in terms of control statements, String Functions

CO6. Communicate effectively using appropriate tools and technologies.

CO7. Design experiments using Visualization and analyze data.

Topics/Content

Class : S.Y.BBA (C.A.) (Semester - IV)

Paper Code : BCA2401

Title of Paper : Advanced Java

Course Outcomes:

By the end of the course, students will be able to:

C**O1**. Learn to access database using Java Data Base Connectivity in Java programs.

CO2. Develop multithreaded application with synchronization.

CO3. Explore and understand Java Server Pages.

CO4. Develop dynamic webpages using Servlets.

CO5. Develop dynamic webpages using JSP.

CO6. Develop and utilize client/server applications and TCP/IP socket programming.

Class : S.Y.BBA (C.A.) (Semester - IV)

Paper Code : BCA2402

Title of Paper: Advanced Web Technologies

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand and implement object-oriented features of PHP programming.
CO2. Illustrate AJAX and web services to develop interactive web applications.
CO3.Students will able to analyze the construction of a web page and relate how PHP and XML combine to produce the web page.
CO4. Students will able to combine Ajax with PHP.
CO5. Develop fast and scalable application combining the power of Ajax and PHP.
CO6. Dynamically access and update PHP applications using XML.
CO7. Students will able to develop interface a PHP script with a MySQL database.

Class : S.Y.BBA (C.A.) (Semester – IV)

Paper Code : BCA2403

Title of Paper: Mathematical Foundation of Data Science

Course Outcomes:

By the end of the course, students will be able to:

CO1. Identify the base case, induction hypothesis, and inductive step in an induction argument, to prove statements using mathematical induction.
CO2. Basic knowledge of functions and relations concepts.
CO3. Construct simple mathematical proofs and possess the ability to verify them.
CO4. Apply the knowledge of matrices to solve the problem.
CO5. Utilize applications of matrices to solve industrial problem.
CO6. Able to find the inverse of a square matrix and solve the matrix equation $Ax = b$ using row operations and matrix operations.
CO7. Able to find the determinant of a product of square matrices, of the transpose of a square matrix, and of the inverse of an invertible matrix.

Class : S.Y.BBA (C.A.) (Semester - IV)

Paper Code : BCA2404

Title of Paper : Software Testing & Quality Assurance

Course Outcomes:

By the end of the course, students will be able to:

CO1. Explain the fundamentals of software testing and automation
CO2. Analyze the design of test cases for different testing techniques.
CO3. Create test strategies and plans, design test case, prioritize and execute them
CO4. Test the software by applying testing techniques to deliver a product free from bugs.
CO5. Illustrate the significance of software testing and object oriented techniques.
CO6. Demonstrate the quality management, assurance, and quality standard to software system.
CO7. Understand and use software test automation tools.

Class : S.Y.BBA (C.A.) (Semester - IV)

Paper Code : BCA2405

Title of Paper: Networking

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand the major concepts involve in various types of computer networks (LAN, MAN, WAN) and technologies behind networks.
CO2. Develop an understanding of modern network architecture from a design and performance.
CO3. Discuss the importance of ISO reference model and TCP/IP Suite.
CO4. Apply the knowledge of different network design and various logical models of networking to solve problems of communication over different transmission medium.
CO5. Get knowledge of various error detection and correction technique to avoid collision and error problem.
CO6. Analyze various routing concepts with routing protocol to develop network related application for future need.
CO7. Utilize the knowledge of different type of network security to solve the complex problem related to network security.

Class : S.Y.BBA (C.A.) (Semester - IV)

Paper Code: BCA2406

Title of Paper: Computer Laboratory based on (BCA2401 and BCA2402)

Course Outcomes-

By the end of the course, students will be able to:

CO1. Learn to access database using JDBC in Java
CO2. Develop Dynamic Web Pages using Servlet & JSP
CO3. Develop client server applications using SOCKET Programming
CO4. Understand the construction of webpages & relate to PHP & XML.
CO5. Design interactive programs using AJAX & PHP, XML.
CO6. Design interactive website using Wordpress.
CO7. Develop user interface based application.

Class : S.Y.BBA (C.A.) (Semester - IV)

Paper Code : BCA2407

Title of Paper: Computer Laboratory based on(BCA2404 and BCA2405)

Course Outcomes-

By the end of the course, students will be able to:

CO1. Understanding Selenium and TestNG tool to perform Automation testing
CO2. Design Effective test cases that can uncover ethical defects in the applications.
CO3. Construct and test simple programs.
CO4. Learn routing concepts along with protocols.
CO5. Understand and develop various applications on packet tracer.
CO6. Understand network devices, IP, Commands & Switching techniques.
CO7. Learn routing concepts along with protocols.

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(Autonomous)

SYLLABUS STRUCTURE OF

Bachelor of Business Administration (Computer Application)

Syllabus (CBCS Pattern) under Academic Autonomy for the year 2021-2022

T.Y.BBA (C.A)(2019- Pattern)

Semester –V (w.e.f.A.Y.2021-2022)

Subject Code	Subject Name	Marks			Credit
		Int	Ext	Total	
BCA3501	Android Application Programming	40	60	100	03
BCA3502	.Net Programming	40	60	100	03
BCA3503A BCA3503B	Elective: Cloud Computing Internet of Things	40	60	100	03
BCA3504A BCA3504B	Elective :Digital Marketing Machine Learning	40	60	100	03
BCA3505	Project	-	-	100	04
BCA3506	Computer Laboratory based on (3501)	40	60	100	02
BCA3507	Computer Laboratory based on (3502)	40	60	100	02
BCA3508	Computer Laboratory based on (3503)	40	60	100	02
Total		**280**	**420**	**800**	**22**

Semester –VI (w.e.f.A.Y.2021-2022)

Subject Code	Subject Name	Marks			Credit
		Int	Ext	Total	
BCA3601	Data Analytics using Python	40	60	100	03
BCA3602	NOSQL Databases	40	60	100	03
BCA3603A BCA3603B	Elective: Big Data Block Chain	40	60	100	03
BCA3604A BCA3604B	Elective : Data Mining Deep Learning	40	60	100	03
BCA3605	Project	-	-	100	04
BCA3606	Computer Laboratory based on (3601)	40	60	100	02
BCA3607	Computer Laboratory based on (3602)	40	60	100	02
	Certificate Course	-	-	-	02
Total		**240**	**360**	**700**	**22**

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3501
Title of Paper : Android Application Programming

Course Outcome:

By the end of the course, students will be able to:

CO1. Build an application using Android development environment.
CO2. Understand the role of the Android SDK (Software Development Kit) in app development
CO3. Apply the method of storing, sharing and retrieving the data in Android Applications.
CO4. Create a mobile Application by using various components like activity, views, services, content providers and receivers.
CO5. Design and develop user interfaces for mobile apps using basic building blocks, UI components and application structure using Emulator.
CO6. Implement activities with dialogs, spinner, fragments and navigation drawer by applying themes.
CO7. Adapt to new features and capabilities introduced in the Android platform.

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3502
Title of Paper : .Net Programming

Course Outcome:

By the end of the course, students will be able to:

CO1. Implement control flow structures (if statements, loops) in .NET applications.
CO2. Explain the components and architecture of the .NET Framework.
CO3. Develop Desktop and Web Application.
CO4. Demonstrate proficiency in the syntax and basic programming constructs of the .NET programming language
CO5. Connect to databases using ADO.NET and Execute SQL queries and manipulate data in a database.
CO6. Understand the Model-View-Controller (MVC) architecture.
CO7. Develop a mindset for continuous learning to keep up with updates and new features in the .NET ecosystem.

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3503A
Title of Paper : Cloud Computing

Course Outcome:

By the end of the course, students will be able to:

CO1. Apply Virtualization Techniques.
CO2. Analyze the different Architectures followed in Cloud Computing
CO3. Evaluate the use of SOA and Distributed Computing.
CO4. Develop applications using Parallel &Distributed Programming.
CO5. Able to understand basic concepts, principles and paradigm of Cloud Computing
CO6. Able to interpret various Cloud computing models and services.
CO7. Able to understand the need of security in Cloud computing.
CO8. Understand the concept SOA and cloud based storage in Cloud computin

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3503B
Title of Paper : Internet of Things

Course Outcome:

By the end of the course, students will be able to:

CO1. Identify the Components that forms part of IoT Architecture.
CO2. Understand the role of sensors, actuators, and communication protocols in IoT.
CO3. Determine the most appropriate IoT Devices and Sensors based on Case Studies.
CO4. Setup the connections between the Devices and Sensors.
CO5. Evaluate the appropriate Protocol for Communication between IoT.
CO6. Analyze the Communication Protocols for IoT.
CO7. Diagnose and troubleshoot issues in IoT systems.

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3504A
Title of Paper : Digital Marketing

Course Outcome:

By the end of the course, students will be able to:

CO1. Explain why we get a huge list of Webpages as a result of a Search.
CO2. Examine why a certain Webpage is ranked higher compared to others.
CO3. Organize how we can ethically boost the ranking of our Webpage.
CO4. Describe some of the latest Technologies used in Digital Marketing.
CO5. Conduct market research using digital tools and techniques.
CO6. Develop and implement a content marketing strategy.
CO7. Effectively communicate digital marketing strategies and results.

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3504B
Title of Paper: Machine Learning

Course Outcome:

By the end of the course, students will be able to:

CO1. Understand the Concepts of Machine Learning
CO2. Apply the Linear Modelling Techniques to solve a Problem
CO3. Understand Distance-Based Clustering Techniques
CO4. Design Tree and Rule-Based Models
CO5. Apply machine learning techniques to real-world problems.
CO6. Describe and compare various machine learning algorithms, such as linear regression, decision trees, support vector machines, and neural networks.
CO7. Understand the strengths and weaknesses of different algorithms in different contexts.

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3505
Title of Paper : Project

Course Outcomes:

By the end of the course, students will be able to:

CO1. Learn project management.
CO2. Become systems thinkers.
CO3. Become explorers.
CO4. Become problem-solvers.
CO5. More engaged in the learning process.
CO6. Learn to take creative risks**.**
CO7. Students are provided to work on multidisciplinary Problems.
CO8. Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3506
Title of Paper : Computer Laboratory based on (3501)

Course Outcomes:

By the end of the course, students will be able to:

CO1. Build enterprise level mobile applications with Java on Android.
CO2. Understand both the basic and advanced concepts of Java.
CO3. Understanding and implementing the lifecycle methods of an Android activity.
CO4. Install and configure Android Studio.
CO5. Explain and use key Android programming concepts.
CO6. Using intents for inter-component communication.
CO7. Deploy the application on SQLite Database, Activity, Views, and View Groups.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3507
Title of Paper: Computer Laboratory based on (3502)

Course Outcome:
By the end of the course, students will be able to:

CO1. Set up and configure a .NET development environment, including the installation of Visual Studio or Visual Studio Code.
CO2. Use Visual Studio IDE to design application.
CO3. Develop GUI Application using Form Controls and its events.
CO4. Apply Object Oriented concepts in GUI Application.
CO5. Use Data access controls to store data in Database and retrieve it.
CO6. Use Data Binding in GUI Application
CO7. Understand deployment considerations for different types of .NET applications.

Class : T.Y.BBA (C.A.) (Semester - V)
Paper Code : BCA3508
Title of Paper : Computer Laboratory based on (3503A)

Course Outcomes:

By the end of the course, students will be able to:

CO1. Understand the basic concepts and services offered by major cloud platforms such as Amazon Web Services (AWS), Microsoft Azure, or Google Cloud Platform (GCP).
CO2. Create and manage user accounts, permissions, and access controls within a cloud platform.
CO3. Deploy virtual machines (VMs) and containers on cloud infrastructure.
CO4. Implement security best practices, including encryption, identity and access management, and network security.
CO5. Analyze real-world case studies and scenarios involving cloud computing.
CO6. Identify core concepts of the cloud computing paradigm, the characteristics, advantages and challenges brought about by the various models and services in cloud computing.
CO7. Utilize cloud storage services for object storage, block storage, and file storage.
CO8. Implement data backups and versioning.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3601
Title of Paper : Data Analytics using python

Course Outcome:
By the end of the course, students will be able to:

CO1. Demonstrate proficiency in using Python for data analytics.
CO2. Develop effective data visualization skills for conveying insights.
CO3. Effectively communicate insights through charts, graphs, and plots.
CO4. Apply statistical methods to analyze and interpret data.
CO5. Clean and preprocess data to handle missing values and outliers.
CO6. Apply simple machine learning algorithms for tasks like regression and classification.
CO7. Apply learned skills to a real-world data analytics project.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3602
Title of Paper: NOSQL Databases

Course Outcome:
By the end of the course, students will be able to:

C O 1 . Assimilate fundamental concepts in the context of a number of different NOSQL products.
CO2. Construct refined Logical Database Model with consideration of Data Semantics and dependency.
CO3. Execute various CRUD operations with MongoDB.
CO4. Build a database System and demonstrate competence with the fundamental tasks involved with its Modeling, Designing, and Implementation.
CO5. Use the MongoDB tools to develop and deploy your Applications.
CO6. Implement Java/ Python / PHP web Application for a real world Problem with MongoDB.
CO7. Explore various types of NoSQL databases, such as document-oriented, key-value stores, column-family stores, and graph databases.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3603A
Title of Paper: Big Data

Course Outcome:
By the end of the course, students will be able to:

- **CO1.** Understand Big Data and Data analysis.
- **CO2.** Understand the role of Hadoop in distributed storage and processing
- **CO3.** Comprehend the principles of distributed computing and understand how distributed computing is applied in Big Data systems.
- **CO4.** Access and Process Data on Distributed File System Manage Job Execution in Hadoop Environment.
- **CO5.** To give the practical enhancement of visualization techniques.
- **CO6.** Explore storage solutions for Big Data, including distributed file systems.
- **CO7.** Learn about technologies that enable real-time data processing.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3603B
Title of Paper : Block Chain

Course Outcome:
By the end of the course, students will be able to:

- **CO1.** Demonstrate a clear understanding of the foundational concepts of block chain technology.
- **CO2.** Explain the decentralized and distributed nature of block chain networks.
- **CO3.** Evaluate different consensus mechanisms used in block chain networks.
- **CO4.** Understand regulatory challenges and considerations in the block chain space.
- **CO5.** Identify and understand emerging technologies with potential implications for block chain development.
- **CO6.** Demonstrate the ability to explain complex block chain ideas to diverse audiences.
- **CO7.** Illustrates to use cryptographic hash functions, public-private key pairs, and digital signatures in a block chain context.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3604A
Title of Paper : Data Mining

Course Outcome:
By the end of the course, students will be able to:

- **CO1.** Demonstrate a clear understanding of the fundamental concepts and goals of data mining.
- **CO2.** Articulate the significance of data mining in extracting valuable patterns and knowledge from large datasets.
- **CO3.** Demonstrate proficiency in preprocessing data, including cleaning, transforming, and handling missing values.
- **CO4.** Apply a range of data mining techniques, including clustering, classification, regression, and association rule mining.
- **CO5.** Train and evaluate predictive models using appropriate metrics.
- **CO6.** Apply data mining techniques to analyze time series data.
- **CO7.** Apply data mining techniques to solve real-world problems in various industries.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3604B
Title of Paper : Deep Learning

Course Outcome:
By the end of the course, students will be able to:

- **CO1.** Demonstrate a clear understanding of the foundational principles and concepts of deep learning.
- **CO2.** Articulate the role of deep learning in the broader field of artificial intelligence.
- **CO3.** Demonstrate proficiency in training neural networks using backpropagation and gradient descent.
- **CO4.** Apply convolutional neural networks for tasks such as image classification and object detection.
- **CO5.** Apply deep learning techniques to natural language processing tasks.
- **CO6.** Understand the impact of hyper parameter choices on model training and generalization.
- **CO7.** Explore emerging technologies and their potential impact on deep learning research and applications.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3605
Title of Paper : Project

Course Outcomes:
By the end of the course, students will be able to:

CO1. Learn project management.

CO2. Become systems thinkers.

CO3. Become explorers.

CO4. Become problem-solvers.

CO5. More engaged in the learning process.

CO6. Learn to take creative risks**.**

CO7. Students are provided to work on multidisciplinary Problems.

CO8. Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3506
Title of Paper : Computer Laboratory based on (3501)

Course Outcome:
By the end of the course, students will be able to:

CO1. Build enterprise level mobile applications with Java on Android.

CO2. Understand both the basic and advanced concepts of Java.

CO3. Understanding and implementing the lifecycle methods of an Android activity.

CO4. Install and configure Android Studio.

CO5. Explain and use key Android programming concepts.

CO6. Using intents for inter-component communication.

CO7. Deploy the application on SQLite Database, Activity, Views, and View Groups.

Class : T.Y.BBA (C.A.) (Semester - VI)
Paper Code : BCA3607
Title of Paper : Computer Laboratory based on (3602)

Course Outcome:
By the end of the course, students will be able to:

CO1. Define and explain the fundamental concepts of NoSQL databases, including their development and key characteristics.

CO2. Perform Create, Read, Update, and Delete (CRUD) operations on NoSQL databases, demonstrating proficiency in handling data.

CO3. Analyze and implement strategies for horizontal scalability and optimize performance in a NoSQL database environment.

CO4. Analyze and apply NoSQL databases to real-world use cases, identifying scenarios where NoSQL is more suitable than traditional relational databases.

CO5. Demonstrate competency in designing NoSQL database management systems.

CO6. Apply NoSQL development tools on different types of NoSQL Databases.

CO7. Compare and contrast RDBMS with different NoSQL databases.

CO8. Evaluate NoSQL database development tools and programming languages.