Anekant Education Society's

Tuljaram Chaturchand College, Baramati

(Empowered Autonomous)

Four Year Degree Program in BBA (CA)

(Faculty of Commerce and Management)

CBCS Syllabus

TYBBA (C.A.) Semester -VI

For Department of BBA (Computer Application)

Tuljaram Chaturchand College

of Arts, Science and Commerce, Baramati

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

To be implemented from Academic Year 2025-2026

Title of the Programme: T.Y.BBA (Computer Application)

Preamble

AES‟s Tuljaram Chaturchand College has made the decision to change the syllabus of across various faculties from June, 2023 by incorporating the guidelines and provisions outlined in the National Education Policy (NEP), 2020. The NEP envisions making education more holistic and effective and to lay emphasis on the integration of general (academic) education, vocational education and experiential learning. The NEP introduces holistic and multidisciplinary education that would help to develop intellectual, scientific, social, physical, emotional, ethical and moral capacities of the students. The NEP 2020 envisages flexible curricular structures and learning based outcome approach for the development of the students. By establishing a nationally accepted and internationally comparable credit structure and courses framework, the NEP 2020 aims to promote educational excellence, facilitate seamless academic mobility, and enhance the global competitiveness of Indian students. It fosters a system where educational achievements can be recognized and valued not only within the country but also in the international arena, expanding opportunities and opening doors for students to pursue their aspirations on a global scale.

In response to the rapid advancements in science and technology and the evolving approaches in various domains of BBA (Computer Application) and related subjects, the Board of Studies in BBA (Computer Application) at Tuljaram Chaturchand College, Baramati - Pune, has developed the curriculum for the fourth semester of T.Y. BBA (Computer Application), which goes beyond traditional academic boundaries. The syllabus is aligned with the NEP 2020 guidelines to ensure that students receive an education that prepares them for the challenges and opportunities of the 21st century. This syllabus has been designed under the framework of the Choice Based Credit System (CBCS), taking into consideration the guidelines set forth by the National Education Policy (NEP) 2020, LOCF (UGC), NCRF, NHEQF, Prof. R.D. Kulkarni's Report, Government of Maharashtra's General Resolution dated 20th April and 16th May 2023, and the Circular issued by SPPU, Pune on 31st May 2023.

BBA (Computer Application) is an Undergraduate Degree Program with Computer Applications and Management Subjects. This program provides sound knowledge of theory and practicals. The different subjects helps the students to design, develop and implement software Applications, to learn emerging computer technologies and produce skilled human resource to face the professional challenges.

Overall, revising the BBA (Computer Application) syllabus in accordance with the NEP 2020 ensures that students receive an education that is relevant, comprehensive, and prepares them to navigate the dynamic and interconnected world of today. It equips them with the knowledge, skills, and competencies needed to contribute meaningfully to society and pursue their academic and professional goals in a rapidly changing global landscape.

Programme Outcome For NEP 2020 (With Effect from June 2025-26)

Commerce and Management (Under Graduate Programme)

PO1: A Fundamental Knowledge and Coherent Understanding:

Student should be able to acquire broad multidisciplinary knowledge in different educational domains and their links to various field of study like Banking, Accounting, Management, Logistics, Marketing, Human Resource Management and Computer Science and Applications.

PO2: Procedural Knowledge for Skill Enhancement:

Students should be able to acquired complete procedural knowledge for deep understanding of every subject and enhancing the subject skills.

PO3: Critical Thinking and Problem-Solving Skills:

Students should be able to solve all types of issues in both known and unknown circumstances, as well as apply what they have learned to real-life situations. Students will be able to conduct investigation on complex problem solving through the design of experiments, analysis and interpretation of data to arrive at valid conclusion.

PO4: Communication Skills:

With the help of various languages students will enhance the communication skills which will improve the personality of the students with the help of interpersonal and intrapersonal communication skills. Students should be able to construct logical arguments using correct technical language related to a field of learning. Also Students should be able to communicate effectively, analyze the concepts and participate in healthy arguments and portray skill in communication and in writing. Possess skills related with banking and other business.

PO5: Analytical Reasoning Skills:

The students should be able to demonstrate the capability to evaluate the reliability and relevance of situation and select the proper course of action. Strengthen analytical skills in business operations and analyze the positive aspects and limitations of conducting trade and trade-related activities according to their extensive knowledge.

PO6: Innovation, Employability and Entrepreneurial Skills:

The students should be able to identify opportunities and pursue those opportunities to create value and wealth for the betterment of the individual and society at large as well as be suitable for employment, as an entrepreneur focused, and serve as a role model for ethical and responsible economic professionals.

PO7: Multidisciplinary Competence:

The student should be able to demonstrate the acquisition of knowledge of the values and beliefs of multiple disciplines. The student should be able to perceive knowledge as an environmental friendly, extensive, interconnected, and interconnected faculty of consciousness that encourages design, interpersonal, and empathetic and understanding environmental challenges across disciplines.

PO8: Value Inculcation through Community Engagement:

The students should be able to implement the acquired knowledge and attitude to embrace constitutional, humanistic, ethical, and moral values in life. Students should be able to participate in community-engaged activities for promoting the well being of the society.

PO9: Traditional Knowledge into Modern Application:

Students should be able to acquire and apply traditional knowledge system in to modern and professional domain.

PO10: Design and Development of System:

Students should be able to design and develop efficient solutions for complex real world computing problems and design system components or processes that meet the specifies needs with appropriate consideration for public health and safety and the cultural, social and environmental considerations.

PO11: Ethical and Social Responsibility:

Students should be able to acquire knowledge of ethics and ethical standards and an ability to apply these with a sense of responsibility within the workplace and community. Understand and accept the moral aspects, accountability, and value system for a nation and society. Students should be able to demonstrate academic accountability, intellectual authenticity, and personal integrity. Students also acquire abilities to comprehend and implement professional ethics.

PO12: Research-Related skills:

The students should be able to acquire the understanding of basic research process, methodology and ethics in practicing personal and social research work, regardless of the field of study

PO13: Teamwork:

The students should be able to able to work constructively, cooperatively, effectively and respectfully as part of a team.

PO14: Area Specific Expertise:

The students should be able to apply various subjective concepts, theories and model in the area of Accounting, Taxation, Marketing, Finance and Human Resource Management, Computer after better understanding of the subject and its contents.

PO15: Environmental Awareness:

The students should be able to manage environmental- related risk from an organization's operation as well as identify environmental hazards affecting air, water and soil quality. The students should be able to manage and controls to reduce and eliminate environmental risk.

Programme Specific Outcomes (PSOs)

PSO1. **Knowledge:** To understand and apply the fundamental principles, concepts, and methods in diverse areas of computer science, computer applications, management, mathematics, statistics, etc.

PSO2. **Problem Analysis:** Identify, analyze and formulate complex real-life computing problems. Attain substantiated conclusions to solve the problems using fundamental principles of computer science and application domains by using various tools and emerging technologies.

PSO3. **Design and Development:** Design and develop efficient solutions for complex real-world computing problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety and the cultural, societal, and environmental considerations.

PSO4.**Conduct investigations of complex problems:** Ability to research, analyze and investigate complex computing problems through the design of experiments, analysis, and interpretation of data, and synthesis of the information to arrive at valid conclusions.

PSO5. **Modern Tool Usage:** Create, identify, and apply appropriate techniques, skills, and modern computing tools to computing activities.

PSO6.**Ethics and Social Responsibility:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

PSO7.**Individual and Team Work:** Ability to work effectively as an individual, and as a member or leader as per need in, multidisciplinary teams.

PSO8.**Life-Long Learning:** Recognize the need and have the ability to engage in Independent continuous, reflective learning in the context of technological advancement.

PSO9. **Project Management:** Understand and apply computing, management principles to manage projects.

PSO10.**Communication:** Able to use interpersonal skills and communicate effectively with the professionals and with society to convey technical information effectively and accurately and able to comprehend and write effective reports, design documentation, and make effective presentations.

PSO11.**Innovation, employability, and Entrepreneurial skills:** Identify opportunities, and pursue those opportunities to create value and wealth for the betterment of the individual and society at large.

Anekant Education Society's

Tuljaram Chaturchand College, Baramati

(Empowered Autonomous)

Board of Studies (BOS) in BBA (Computer Application)

From 2025-26 to 2027-28

Sr. No.	Name	Designation
1	Mrs. Salma Shaikh	Chairperson
2	Dr. Poonam Ponde	Expert from SPPU Pune
3	Dr. Sagar Jambhorkar	Expert from other University
4	Dr. Kamlesh Meshram	Expert from other University
5	Mr. Akshay Jaisinghani	Industry Expert
6	Mrs.Pooja Shinde	Alumni Representative
7	Mrs. Ashwini Bhosale	Member
8	Mr. Dattatray Aarde	Member
9	Ms. Trupti Bhosale	Member
10	Mr. Vishal Shah	Member
11	Mrs. Smita Kachare	Invitee Member
12	Ms. Harshada Pingle	Student Representative
13	Mr. Swapnil Kale	Student Representative

Credit Distribution Structure for T.Y.BBA (Computer Applications) 2025-2026

Level	Sem	Major		Minor	VSC, SEC, (VSEC)	OJT, FP, CEP, CC,RP	Cum. Cr/ Sem	Degree/ Cum.Cr.
		Mandatory	**Electives**					
	V	**BBACA-301-MJM: Data** Analytics Using Python (2T)	**BBACA-306-MJE(A):** Software Project Management (2T)	**BBACA-311-MN:** Digital Marketing (2T)	**BBACA-321-VSC:** Practical Lab on .Net Framework (2P)	**BBACA-335-FP:** Field Project (2P)	22	UG Certificate 44 credits
		BBACA-302-MJM: .Net Framework (2T)	**BBACA-306-MJE(B)** Block Chain (2T)	**BBACA-312-MN:** Practical Lab on Digital Marketing (2P)				
		BBACA-303-MJM: Cloud Computing (2T)	**BBACA-306-MJE(C):** Digital Image Processing (2T)					
		BBACA-304-MJM: Cyber Security (2T)						
		BBACA-305-MJM: Practical Lab on Data Analytics Using Python (2P)						
	VI	**BBACA-351-MJM** Android Programming (2T)	**BBACA-356-MJE(A):** Machine Learning (2T)	**BBACA-361-MN:** E-commerce (2T)		**BBACA-385-OJT:** On Job Training (4P)	22	
		BBACA-352-MJM: Data Mining (2T)	**BBACA-356-MJE(B):** Big Data (2T)	**BBACA-362-MN :** Practical Lab on Software tools for Business Communication (2P)				
		BBACA-353-MJM: Artificial Intelligence (2T)	**BBACA-356-MJE(C):** Recent trends in IT (2T)					
		BBACA-354-MJM : NoSQL (2T)					44	
		BBACA-355-MJM: Practical Lab on BBACA-351-MJM & BBACA-354-MJM (2P)						
	Cum Cr.	20	8	8	2	6		

Course Structure for T.Y.BBA (C.A.) (2023 Pattern)

Sem	Course Type	Course Code	Course Title	Theory/ Practical	Credits
V	Major Mandatory	BBACA-301-MJM	Data Analytics Using Python	Theory	02
	Major Mandatory	BBACA-302-MJM	.Net Framework	Theory	02
	Major Mandatory	BBACA-303-MJM	Cloud Computing	Theory	02
	Major Mandatory	BBACA-304-MJM	Cyber Security	Theory	02
	Major Mandatory	BBACA-305-MJM	Practical Lab on Data Analytics Using Python	Practical	02
	Major Elective (MJE)	BBACA-306-MJE(A)	Software Project Management	Theory (Any two)	04
	Major Elective (MJE)	BBACA-306-MJE(B)	Block Chain		
	Major Elective (MJE)	BBACA-306-MJE(C)	Digital Image Processing		
	Minor	BBACA-311-MN	Digital Marketing	Theory	02
	Minor	BBACA-312-MN	Practical Lab on Digital Marketing	Practical	02
	Vocational Skill Course (VSC)	BBACA-321-VSC	Practical Lab on .Net Framework	Practical	02
	Field Project(FP)	BBACA-335-FP	Field Project	Practical	02
			Total Credits Semester-V		**22**
VI	Major Mandatory	BBACA-351-MJM	Android Programming	Theory	02
	Major Mandatory	BBACA-352-MJM	Data Mining	Theory	02
	Major Mandatory	BBACA-353-MJM	Artificial Intelligence	Theory	02
	Major Mandatory	BBACA-354-MJM	NoSQL	Theory	02
	Major Mandatory	BBACA-355-MJM	Practical Lab on BBACA-351-MJM & BBACA-354-MJM	Practical	02
	Major Elective(MJE)	BBACA-356-MJE(A)	Machine Learning	Theory (Any two)	04
	Major Elective(MJE)	BBACA-356-MJE(B)	Big Data		
	Major Elective(MJE)	BBACA-356-MJE(C)	Recent trends in IT		
	Minor	BBACA-361-MN	E-commerce	Theory	02
	Minor	BBACA-362-MN	Practical Lab on Software tools for Business Communication	Practical	02
	On Job Training(OJT)	BBACA-385-OJT	On Job Training	Practical	04
			Total Credits Semester-VI		**22**
			Total Credits Semester-V+ VI		**44**

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme : BBA (Computer Application)
Programme Code : BBACA
Class : T.Y. BBA (C.A)
Semester : VI
Course Type : Major Mandatory (Theory)
Course Code : BBACA-351-MRM
Course Title : Android Programming
No. of Credits : 02
No. of Teaching Hours : 30

Course Objectives:

1. Learn the history, features, architecture, and tools used in Android development.
2. Get hands-on practice by creating simple Android applications.
3. Learn how to use activities, fragments, and intents to build interactive apps.
4. Understand layouts, views, and components to create structured mobile app screens.
5. Apply menus, lists, images, and other interactive components in app design.
6. Learn how to use SQLite for storing, retrieving, and managing data in apps.
7. Combine UI, activities, fragments, and databases to design functional Android applications.

Course Outcomes:

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

CO1: Explain the features, versions, and architecture of the Android operating system.

CO2: Develop simple Android applications using Android Studio and SDK tools.

CO3: Implement activities, fragments, and intents to build interactive mobile applications.

CO4: Design structured user interfaces using different layouts and view groups.

CO5: Apply various UI components such as buttons, menus, lists, and images in Android apps.

CO6: Manage local data storage in Android applications using SQLite databases.

CO7: Integrate user interface design, activity management, and database handling to create complete mobile applications.

	Topics and Learning Points	Teaching Hours
UNIT-01	**Introduction to Android**	**05**
1.1	Overview	
1.2	History	
1.3	Features of Android	
1.4	Architecture of Android	
	1.4.1 Overview of Stack	
	1.4.2 Linux Kernel	
	1.4.3 Native Libraries	
	1.4.4 Android Runtime	
	1.4.5 Application Framework	
1.5	SDK Overview 1.5.1 Platforms	
1.6	Tools – (JDK, SDK, Eclipse/Android Studio, ADT, AVD, Android Emulator)	
1.7	Versions	
1.8	Creating your first Android Application.	
UNIT-02	**Activities, Fragments and Intents**	**08**
2.1	Introduction to Activities	
2.2	Activity Lifecycle	
2.3	Introduction to Intents	
2.4	Linking Activities using Intents	
2.5	Calling built-in applications using Intents	
2.6	Introduction to Fragments	
2.7	Adding Fragments Dynamically	
2.8	Lifecycle of Fragment	
UNIT-03	**Android User Interface**	**04**
3.1	Understanding the Components of a Screen	
3.2	Views and View Groups	
3.3	Linear Layout	
3.4	Absolute Layout	
3.5	Table Layout	
3.6	Relative Layout	
3.7	Frame Layout	
3.8	Scroll Layout	

UNIT-04	**Designing Your User Interface with Views**	**09**
4.1	Using Basic Views	
4.2	Text View	
4.3	Button, Image Button, Edit Text, Check Box	
4.4	Toggle Button, Radio Button, and Radio Group Views Progress Bar View	
4.5	Auto Complete Text View	
4.6	Using List View	
4.7	List View	
4.8	Using the Spinner View	
4.9	Using Image Views to Display Pictures	
4.1	Gallery and Image View views	
4.11	Image Switcher	
4.12	Grid View	
4.12	Using Menus with Views	
4.12	Creating the helper methods	
4.12	Options Menu	
4.12	Context Menu	
UNIT-05	**Databases – SQLite**	**04**
5.1	Introduction to SQLite	
5.2	SQLiteOpenHelper and SQLite Database	
5.3	Creating , Opening and Closing database	
5.4	Working with Cursors, Insert, Update, Delete	
5.5	Building and Executing queries	

References:

1. Beginning Android4 Application Development, By Wei-Meng Lee WILEY India Edition WROX Publication

2. Professional Android 4 Application Development, By Reto Meier WROX Publication

3. The official site for Android developers - https://developer.android.co

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: T.Y. BBA (C.A) **Subject**: BBA (C.A)

Course: Android Programming **Course Code**: BBACA-351-MRM

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

CO-PO Mapping Table

CO/PO	PO1	P O2	P O3	P O4	P O5	P O6	P O7	P O8	P O9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15
CO1	3	3	2	1	3	2	1	–	–	3	1	2	1	3	2
CO2	3	3	3	2	2	3	1	–	–	3	1	2	2	3	2
CO3	3	3	2	3	2	3	1	–	1	3	1	2	2	3	2
CO4	3	3	2	2	3	3	1	–	1	3	1	2	1	3	2
CO5	3	3	3	2	3	3	2	–	–	3	1	2	2	3	2
CO6	3	3	3	3	3	3	2	1	1	3	1	3	3	3	2
CO7	3	3	3	3	3	3	2	1	1	3	2	3	3	3	3

PO1: Fundamental Knowledge and Coherent Understanding

CO1–CO7 are strongly mapped as the course builds fundamental understanding of Android OS architecture, SDK tools, and mobile app components. Students develop a coherent knowledge base required for building Android applications from scratch.

PO2: Procedural Knowledge for Skill Enhancement

CO1–CO7 are strongly mapped since learners apply procedural knowledge in Android Studio to design, code, debug, and deploy applications using layouts, activities, and data management modules.

PO3: Critical Thinking and Problem-Solving Skills

CO2–CO7 are strongly mapped because debugging runtime errors, managing activities, and integrating UI with backend data require logical thinking and problem-solving abilities to achieve desired outcomes.

PO4: Communication Skills

CO3, CO5, CO6, CO7 are moderately mapped since documenting Android apps, explaining UI/UX designs, and presenting app functionality enhance students' ability to communicate technical ideas effectively.

PO5: Analytical Reasoning Skills

CO1, CO2, CO4, CO5, CO6, CO7 are strongly mapped as students analyze app behavior, resource utilization, and database interactions, employing systematic reasoning to refine and optimize mobile app performance.

PO6: Innovation, Employability, and Entrepreneurial Skills
CO2–CO7 are strongly mapped as developing Android applications fosters innovation and provides industry-relevant skills for entrepreneurship and employability in mobile app development sectors.

PO7: Multidisciplinary Competence
CO5–CO7 are moderately mapped since Android apps are used across various fields such as healthcare, tourism, business, and education, promoting interdisciplinary integration and adaptability.

PO8: Value Inculcation through Community Engagement
CO6 and CO7 have weak mapping as Android development can indirectly contribute to community engagement by enabling apps for social welfare, education, or accessibility purposes.

PO9: Traditional Knowledge into Modern Application
CO3, CO4, CO6, CO7 are moderately mapped as traditional programming and UI design principles are integrated into modern, mobile-based digital platforms bridging classical computing logic with contemporary technologies.

PO10: Design and Development of System
CO1–CO7 are strongly mapped because students design, develop, and deploy complete mobile systems integrating UI, data handling, and activity management for real-world solutions.

PO11: Ethical and Social Responsibility
CO5–CO7 are moderately mapped since app development requires ethical consideration in handling user data, ensuring privacy, and developing accessible, socially responsible software.

PO12: Research-Related Skills
CO5–CO7 are moderately mapped as students experiment with UI performance, database optimization, and system testing, developing a practical and research-oriented mindset toward mobile app efficiency.

PO13: Teamwork
CO5–CO7 are moderately mapped because Android project development often involves collaboration among developers, designers, and testers, enhancing coordination and teamwork abilities.

PO14: Area Specific Expertise
CO1–CO7 are strongly mapped since Android development is a domain-specific expertise area that equips students with hands-on skills in mobile technologies, app architecture, and Android SDK tools.

PO15: Environmental Awareness
CO6–CO7 are weakly mapped because Android apps can promote environmental consciousness indirectly by building apps for sustainability, awareness campaigns, or resource- efficient mobile design.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme : BBA (Computer Application)

Programme Code : BBACA

Class : T.Y. BBA (C.A)

Semester : VI

Course Type : Major Mandatory

Course Code : BBACA-352-MJM

Course Title : Data Mining

No. of Credits : 02

No. of Teaching Hours : 30:

Course Objectives:

1. To introduce the basic concepts and processes of data mining.
2. To identify and analyse issues in data mining and knowledge discovery.
3. To understand data pre-processing techniques for improving data quality.
4. To learn the concepts of data warehouse, architecture, and OLAP operations.
5. To explore association rule mining algorithms and their applications.
6. To apply data mining techniques in solving real-world problems.

Course Outcomes:

After successfully completing this course, students will be able to:

CO1. Define key concepts and issues in data mining.

CO2. Explain and apply data pre-processing techniques.

CO3. Describe data warehouse architecture and OLAP operations.

CO4. Construct and evaluate classification models using various methods.

CO5. Apply decision tree, Bayesian, and nearest neighbour classifiers for prediction.

CO6. Implement association rule mining using Apriori and FP-Growth.

CO7. Demonstrate applications of data mining in different domains.

Topics and Learning Points

Unit 1: Introduction to Data Mining (05 Lectures)

1.1.Definition and Concepts

1.1.1 Definition of Data Mining

1.1.2 Stages of Data Mining Process (KDD)

1.2 Data Mining Issues

1.3 Data Mining Techniques / Tasks

1.4 Knowledge Representation Methods

1.5 Applications of Data Mining

Unit 2: **Data Pre-processing and Data Warehouse** (10 Lectures)

2.1. Data Pre-processing

2.1.1. Data Cleaning

2.1.2. Data Transformation

2.1.3. Data Reduction

2.1.4. Data Discretization

2.2. Introduction to Data Warehouse

2.3. Data Warehouse Architecture and Components

2.4. Data Modeling with OLAP

2.4.1. Introduction

2.4.2. Difference between OLTP and OLAP

2.4.3. Data Mart

2.5. OLAP Operations and Structures

2.5.1. Fact Table, Dimension Table, OLAP Cube

2.5.2. Different OLAP Operations

Unit 3: **Classification** (10 Lectures)

3.1. Introduction to Classification

3.1.1.Definition

3.1.2.Model Evaluation and Selection

3.2. Decision Tree Methods

3.2.1.Construction Principle

3.2.2.Attribute Selection Measures

3.2.3.Tree Pruning

3.3. Rule-Based Classification

3.3.1.IF-THEN Rules

3.3.2.Rule Extraction from Decision Tree

3.4. Bayesian Methods

3.4.1 Bayes' Theorem

3.4.2 Naive Bayesian Classification

3.4.3 Bayesian Networks

3.5. Other Classification Methods

3.5.1.Nearest Neighbour Classifiers

3.5.2.Neural Networks

Unit 4: **Association Rule Mining** (05 Lectures)

4.1. Introduction to Association Rules

4.2. Apriori Algorithm

4.3. Frequent Pattern Growth (FP-Growth)

4.4. Mining Advanced Rules

4.4.1.Multilevel Association Rules

4.4.2.Multidimensional Association Rules

4.5.Applications of Association Rule Mining

References:

1. *Concepts and Techniques* – Jiawei Han, Kamber, Pei, 3rd Ed., Morgan Kaufmann, 2011
2. *Data Mining: Practical Machine Learning Tools and Techniques* – Witten, Frank, Hall, 4th Ed., Morgan Kaufmann, 2016
3. *Data Mining and Predictive Analytics* – Daniel T. Larose, 2nd Ed., Wiley, 2015
4. *Data Mining: Introductory and Advanced Topics* – Margaret H. Dunham, Pearson, 2003
5. *Data Mining: The Textbook* – Charu C. Aggarwal, Springer, 2015

Web Resources:

1. https://www.kaggle.com/datasets?utm_source=chatgpt.com
2. https://community.ibm.com/community/user/marketingstaticlanding-pages/welcome-data-community458?utm_source=chatgpt.com

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: T.Y. BBA (C.A) **Subject:** BBA(C.A.)

Course: Data Mining **Course Code:** BBACA-352-MJM

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

CO-PO Mapping Table:

COs/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	1	1	1	1	2	1	1	1	3	1
CO2	3	3	2	1	2	1	1	1	1	2	1	2	1	3	1
CO3	3	2	2	1	2	1	1	1	1	3	1	1	1	3	1
CO4	2	3	3	2	3	2	1	1	1	3	1	2	2	3	1
CO5	2	3	3	2	3	2	1	1	1	3	1	2	2	3	1
CO6	2	3	3	2	3	3	1	1	1	3	1	2	2	3	1
CO7	3	2	3	2	3	3	2	2	2	3	2	2	2	3	2

PO1: Fundamental Knowledge and Coherent Understanding

CO1–CO3 strongly relate; CO4–CO7 also contribute by expanding understanding with classification, association rules, and real-world applications.

PO2: Procedural Knowledge for Skill Enhancement

CO2, CO4–CO6 strongly relate; CO1, CO3, CO7 moderately relate through foundational and applied understanding.

PO3: Critical Thinking and Problem-Solving Skills

CO2, CO4–CO7 strongly relate; CO1, CO3 moderately relate in supporting systematic problem-solving.

PO4: Communication Skills

CO4–CO7 moderately relate in explaining results and presenting findings; CO1–CO3 weakly relate.

PO5: Analytical Reasoning Skills

CO2, CO4–CO7 strongly relate; CO1, CO3 moderately relate through foundational analytical understanding.

PO6: Innovation, Employability, and Entrepreneurial Skills

CO5–CO7 strongly relate; CO1–CO4 moderately relate by providing technical support for innovation.

PO7: Multidisciplinary Competence

CO7 strongly relates; CO1–CO6 weakly relate.

PO8: Value Inculcation through Community Engagement

CO7 moderately relates; CO1–CO6 weakly relate.

PO9: Traditional Knowledge into Modern Application

CO7 moderately relates; CO1–CO6 weakly relate.

PO10: Design and Development of System

CO4–CO7 strongly relate; CO1–CO3 moderately relate.

PO11: Ethical and Social Responsibility

CO5–CO7 moderately relate; CO1–CO4 weakly relate.

PO12: Research-Related Skills

CO2, CO4–CO7 moderately relate; CO1, CO3 weakly relate.

PO13: Teamwork

CO4–CO7 moderately relate; CO1–CO3 weakly relate.

PO14: Area Specific Expertise

CO4–CO7 strongly relate; CO1–CO3 moderately relate.

PO15: Environmental Awareness

CO7 moderately relate; CO1–CO6 weakly relate.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme : BBA (Computer Application)

Programme Code : BBACA

Class : T.Y. BBA (C.A)

Semester : VI

Course Type : Artificial Intelligence

Course Code : BBACA-353-MJM

Course Title : Artificial Intelligence

No. of Credits : 02

No. of Teaching Hours : 30

Course Objectives:

1. Understand the fundamental concepts and evolution of AI.
2. Differentiate AI, Machine Learning, and Deep Learning.
3. Explore real-world AI applications and domains.
4. Learn problem-solving using state space representation and search algorithms.
5. Apply knowledge representation techniques for AI systems.

Course Outcomes:

After successfully completing this course, students will be able to:

CO1. Explain the fundamentals, scope, and evolution of Artificial Intelligence.

CO2. Distinguish between AI, Machine Learning, and Deep Learning concepts with suitable examples.

CO3. Identify and analyse real-life applications of AI across various domains.

CO4. Demonstrate understanding of intelligent agents, environments, and their structural components.

CO5. Formulate problems as state space searches and apply suitable problem-solving techniques.

CO6. Implement and compare different search algorithms for efficient solution finding.

CO7. Represent and reason about knowledge using propositional, predicate logic, and structured

		Topics and Learning Points	Teaching Hours
Unit I		**Introduction to Artificial Intelligence**	**(05 Lecture)**
	1.1	Introduction to AI	
	1.2	Comparison of AI, Machine Learning, Deep Learning	
	1.3	Applications of AI	
	1.4	AI Techniques: NLP, Computer Vision	
	1.5	Intelligent Agents, Agents and Environments, Structure of Agents	
	1.6	Generative AI: Concept, Types (Text, Image, Audio, Video Generation), and Uses	
Unit II		**Problems, Problem Spaces and Search**	**(10 Lectures)**
	2.1	Defining problem as a State Space Search	
	2.2	Production System	
	3.3	Problem Characteristics	
	2.4	Search & Control Strategies	
	2.5	Classic Problems – Water Jug, Missionary Cannibal, Monkey & Banana, Block world	
Unit III		**Searching Algorithms**	**(10 Lecture)**
	3.1	Uninformed Search Algorithms	
	3.1.1	Breadth-first Search	
	3.1.2	Depth-first Search	
	3.2	Informed (Heuristic) Search Techniques	
	3.2.1	Generate-and-Test	
	3.2.2	Simple Hill Climbing	
	3.2.3	Best First Search	
	3.2.4	A* and AO* Algorithm	
Unit IV		**Knowledge Representation & Slot and Filter Structures**	**(05 Lectures)**
	4.1	Knowledge: Definition & Types	
	4.2	Approaches to Knowledge Representation	
	4.3	Knowledge using Propositional & Predicate Logic	
	4.4	Weak Structures and Strong Structures	

References:

1. Artificial Intelligence: A Modern Approach – Stuart Russell & Peter Norvig;
2. Neural Networks and Deep Learning – Charu C. Aggarwal;
3. Introduction to Artificial Intelligence and Expert Systems – Dan W. Patterson;
4. Artificial Intelligence – Elaine Rich & Kevin Knight;
5. MIT News – "Explained**:** Generative AI" (https://news.mit.edu/2023/explained-generative-ai-1109

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: TY BBA (C.A) **Subject:** BBA(C.A.)

Course: Artificial Intelligence **Course Code:** BBACA-353-MJM

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

CO-PO Mapping Table:

COs/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	1	2	1	2	1	1	1	1	1	1	2	1
CO2	3	2	2	1	2	2	2	1	1	2	1	1	1	2	1
CO3	3	2	3	1	3	2	2	1	2	3	1	1	1	3	2
CO4	2	2	3	1	3	2	1	1	1	3	1	1	1	2	1
CO5	2	3	3	1	3	2	1	1	1	3	1	1	1	3	1
CO6	2	3	3	1	3	3	1	1	1	3	1	1	1	3	1
CO7	3	2	3	1	3	2	1	1	1	3	1	1	1	3	1

PO1. Fundamental Knowledge and Coherent Understanding

Strongly linked with **CO1, CO2, CO3,** and **CO7** as students gain foundational understanding of AI concepts, their multidisciplinary nature, and applications integrating computing and reasoning.

PO2. Procedural Knowledge for Skill Enhancement

Directly mapped with CO2, CO5, CO6, and CO7 as students acquire procedural understanding of search algorithms, heuristics, and knowledge representation methods.

PO3. Critical Thinking and Problem-Solving Skills

Strongly linked with CO3, CO4, CO5, CO6, and CO7 since the course emphasizes state-space formulation, heuristic strategies, and AI-based reasoning for solving complex problems.

PO4. Communication Skills

Weakly related to all COs, as students articulate technical concepts and reasoning processes in AI through reports, presentations, and discussions.

PO5. Analytical Reasoning Skills

Strongly connected to CO3–CO7, as learners apply analytical thinking to evaluate algorithms, interpret data, and assess the efficiency of problem-solving techniques.

PO6. Innovation, Employability, and Entrepreneurial Skills

Moderately related to CO2, CO3, CO5, and CO6, where AI knowledge fosters innovation, employability,

and creative problem-solving applicable to industry and start-ups.

PO7. Multidisciplinary Competence

Linked with CO1, CO2, and CO3 as students explore intersections of AI with mathematics, statistics, and cognitive sciences.

PO8. Value Inculcation through Community Engagement

Weakly related to CO3, as AI solutions promote societal welfare through ethical and socially responsible applications.

PO9. Traditional Knowledge into Modern Application

Moderately related to CO3, as AI enables transforming traditional decision-making and problem-solving into modern automated systems.

PO10. Design and Development of System

Strongly linked with CO4–CO7, where students design intelligent agents, apply search strategies, and develop AI models to solve real-world challenges.

PO11. Ethical and Social Responsibility

Weakly related to CO3, as students learn ethical considerations, data privacy, and responsible use of AI technologies.

PO12. Research-Related Skills

Linked with CO5–CO7, helping students build foundational analytical and logical reasoning skills essential for future AI research.

PO13. Teamwork

Weakly connected to CO5–CO6, since algorithm design and testing often involve collaboration and cooperative learning.

PO14. Area Specific Expertise

Strongly related to CO3–CO7, as the course builds expertise in Artificial Intelligence, a crucial domain of Computer Science and Applications.

PO15. Environmental Awareness

Weakly linked with CO3, recognizing the potential of AI applications in environmental monitoring, conservation, and **sustainability.**

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme	**:** BBA (Computer Application)
Programme Code	**:** BBACA
Class	**:** T.Y. BBA (C.A)
Semester	**:** VI
Course Type	**:** Major (Theory)
Course Code	**:** BBACA-354-MJM
Course Title	**:** NoSQL
No. of Credits	**:** 02
No. of Teaching Hours	**:** 30

Course Objectives:

1. Understand the role and importance of NoSQL databases in managing large, distributed, and unstructured data.
2. Learn and apply key MongoDB commands for data management and querying.
3. Identify MongoDB's design goals emphasizing scalability, flexibility, and performance.
4. Design and build basic databases using MongoDB best practices.
5. Develop and optimize MongoDB databases for diverse real-world applications.

Course Outcomes:

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

CO1: Use MongoDB shell and tools for efficient database management.

CO2: Design and model schemas for effective data organization.

CO3: Perform CRUD operations for reliable data handling.

CO4: Optimize queries to improve database performance.

CO5: Analyze MongoDB data for meaningful insights.

CO6: Apply MongoDB tools to manage and scale NoSQL databases.

CO7: Understand key NoSQL principles of performance, scalability, and flexibility.

Topics And Learnings

Unit 1: Introduction to NoSQL (05L)

1.1 Evolution of Databases: From RDBMS to NoSQL.

1.2 Characteristics and Features of NoSQL.

1.3 CAP Theorem and BASE Properties.

1.4 Types of NoSQL Databases (Key-Value, Document, Column, Graph).

1.5 Advantages and Limitations of NoSQL.

1.6 Exploring Mongo DB java

1.7 Exploring Mongo DB Ruby/Python

Unit 2: **NOSQL Basics** (10L)

2.1 Understanding the NOSQL Architecture

2.2 Performing CRUD operations

2.3 Querying NOSQL Stores

2.4 Modifying Data Stores and Managing Evolution

2.5 Indexing and Ordering

2.6 Datasets.

Unit 3: **Advanced NOSQL** (10L)

3.1 NOSQL in Cloud.

3.2 Parallel Processing with Map Reduce.

3.3 Big Data with Hive.

3.4 Surveying Database.

3.5 Migrating from RDBMS to NOSQL.

3.6 Web Frameworks and NOSQL.

3.7 Using MYSQL as a NOSQL.

3.8 Replication and Sharding in MongoDB.

3.9 Backup and Recovery in MongoDB.

Unit 4: **MongoDB Index and Aggregation** (05L)

4.1 Index Introduction, Index Concepts, Index Types, Index Properties

Index Creation and Indexing Reference

Introduction to Aggregation

4.2 Approach to Aggregation

4.3 Types of Aggregation (Pipeline, MapReduce & Single Purpose)

4.4 Performance Tuning.

References:

1. Pramod J. Sadalage & Martin Fowler – NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence, Addison-Wesley, 2012.
2. Kristina Chodorow – MongoDB: The Definitive Guide, O'Reilly Media, 3rd Edition, 2019.
3. Kyle Banker, Peter Bakkum, Shaun Verch, Douglas Garrett, Tim Hawkins – MongoDB in Action, 2nd Edition, Manning Publications, 2016.
4. Dan Sullivan – NoSQL for Mere Mortals, Addison-Wesley, 2015.
5. Shashank Tiwari – Professional NoSQL, Wiley Publishing, 2011.
6. Rick Copeland – MongoDB Applied Design Patterns, O'Reilly Media, 2013.
7. Ravindra Thammaiah – Mastering MongoDB 6.x: The Complete Practical Guide, BPB Publications, 2023.
8. Adam Fowler – NoSQL For Dummies, John Wiley & Sons, 2015.

Website Links:

1. https://www.mongodb.com/docs/ – Official MongoDB Documentation.
2. https://www.tutorialspoint.com/mongodb – MongoDB Tutorials and Examples.
3. https://www.geeksforgeeks.org/nosql-databases/ – NoSQL Theory and Practice Tutorials.
4. https://www.coursera.org/learn/nosql-databases – Coursera Course on NoSQL Databases.
5. https://www.w3schools.com/mongodb/ – MongoDB Basic to Advanced Concepts

Choice Based Credit System Syllabus (2024 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: T.Y. BBA (C.A) **Subject: BBA (C.A)**

Course Type: NoSQL **Course Code:** BBACA-354-MRM

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	3	2	1	2	2	1	–	–	2	1	1	–	2	–
CO2	3	3	3	–	2	2	2	–	–	3	1	1	–	3	1
CO3	2	3	3	–	2	3	–	–	–	2	1	–	–	3	–
CO4	2	2	3	–	3	2	1	–	–	3	–	1	–	3	–
CO5	2	2	3	1	3	2	–	1	–	2	1	2	–	2	1
CO6	3	3	3	–	3	3	2	–	–	3	1	2	2	3	1
CO7	3	2	2	–	2	3	3	1	1	3	1	2	–	3	2

PO1. Knowledge:

CO1, CO2, CO3, CO5, and CO7 are strongly mapped because mastering MongoDB tools and operations needs a solid understanding of NoSQL concepts, data structures, and database management principles.

PO2. Problem Analysis:

CO2 and CO4 are strongly mapped since schema design and query optimization require problem identification, logical analysis, and developing efficient data handling solutions.

PO3. Design and Development:

CO2, CO3, CO4, and CO7 are strongly mapped as students learn to design database structures, perform CRUD operations, and develop scalable systems using MongoDB.

PO4. Conduct Investigations of Complex Problems:

CO5 is strongly mapped because analyzing and interpreting large datasets in MongoDB involves applying investigation, data exploration, and result interpretation skills.

PO5. Modern Tool Usage:

CO1, CO2, CO3, CO4, and CO6 are strongly mapped since students use MongoDB shell, Compass, and Atlas tools for database design, management, and scaling in real-world projects.

PO6. Innovation, Employability and Entrepreneurial Skills:

CO6 and CO7 are strongly mapped as the course encourages the use of MongoDB in real-world applications, enhancing employability and inspiring innovative database solutions.

PO7. Multidisciplinary Competence:

CO2 and CO7 are moderately mapped because MongoDB can be applied across various fields such as e-commerce, healthcare, finance, and education — showing its multidisciplinary importance.

PO8. Value Inculcation through Community Engagement:

CO5 and CO7 are weakly mapped as students can apply data management knowledge in projects that support community development, research, or public data management initiatives.

PO9. Traditional Knowledge into Modern Application:

CO7 is moderately mapped because it connects traditional database principles (like relational models) with modern NoSQL approaches used in scalable and distributed systems.

PO10. Design and Development of System:

CO2, CO3, CO4, and CO6 are strongly mapped since students design and develop efficient MongoDB-based systems to meet modern data management requirements.

PO11. Ethical and Social Responsibility:

CO5 and CO6 are moderately mapped as students learn about secure, responsible handling of data and ethical use of information in databases and analytics.

PO12. Research-Related Skills:

CO5 and CO7 are moderately mapped because analyzing data in MongoDB develops research aptitude, data interpretation, and evidence-based problem-solving abilities.

PO13. Teamwork:

CO6 is moderately mapped since managing and scaling MongoDB databases often involves collaboration, teamwork, and sharing tasks during real-world or academic projects.

PO14. Area Specific Expertise:

CO1, CO2, CO3, CO4, CO6, and CO7 are strongly mapped as the course provides specialized knowledge in NoSQL databases, preparing students for roles in data management, analytics, and software development.

PO15. Environmental Awareness:

CO7 is moderately mapped as understanding database scalability includes awareness of efficient data storage, cloud usage, and energy-efficient database management practices.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme	**:** BBA (Computer Application)
Programme Cod	**:** BBACA
Class	**:** T.Y.BBA (C.A)
Semester	**:** VI
Course Type	: Major Elective (Theory)
Course Code	: BBACA-355-MRM
Course Title	: Practical Lab on Android Programming
No. of Credits	**:** 02
No. of Teaching Hours	**:** 60

Course Objectives:

1. Understand Android fundamentals, architecture, and development tools.
2. Build interactive apps using Activities, Fragments, and Intents.
3. Design responsive UIs with components, layouts, and advanced controls.
4. Manage persistent data using SQLite.
5. Develop problem-solving, debugging, and project implementation skills.
6. Develop Android applications with interactive UI components, navigation (Activities, Fragments, Intents), and proper app architecture.
7. Teach students to store, retrieve, and manage data using NoSQL and integrate it seamlessly with apps for real-time functionality.

Course Outcomes:

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

CO1: Understand the basics of Android, NOSQL and its development tools.

CO2: Create Android apps using Activities, Fragments, and Intents.

CO3: Design user-friendly interfaces with layouts and views.

CO4: Use advanced UI components like menus, lists, and images.

CO5: Store and manage data in Android apps using SQLite.

CO6: Perform CRUD operations and manage app data using a NoSQL database**,** ensuring real-time data updates..

CO7: Develop a complete Android app or mini-project using learned skills.

Practical Assignment

1) Write a Program to make Android application which having simple activity to shows any Message in TextView when click on Button "Click Me."

2) Write a Program to make Android application which accept string by EdiText and print that string in Uppercase, Bold, Size = 64dp, Center Alignment, Change Text Color when you click on Show Button.

3) Write a Program to make Android application which shows use of all methods in Activity life cycle.

4) Write a Program to make Android application which accept the any number and finds square. Result display in TextView after click on Button Show.

5) Write a Program to make Android application creates a simple calculator to make addition, subtraction, multiplication & division. which accept any two values and display results in EditText.

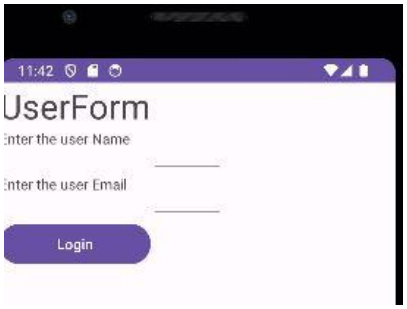
6) Write a Program to make Android Application which open the URL: "https:google.com" after click on Click Me Button (Use intent concept.)

7) Write a program to make Android Application to call various built in application (to Dial number, to open http://www.amazon.com)

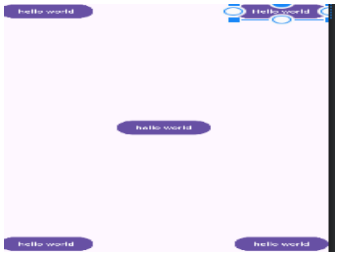
8) Write a Program to make Android Application to create User Form having details username, mobile number and password in first activity and show that value into another activity by using intent.

9) Create a simple application which display scroll layout of 15 Button. (use LinearLayout to show all Button/textview/images

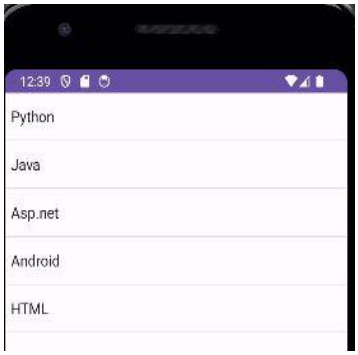
10) Create a simple application which creates simple userform by using TableLayout. (User form having field -Enter the user Name ,Enter User Email with login & Cancel Button)



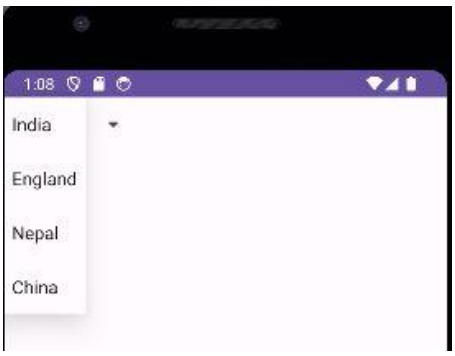
11) Create a simple application to use of Relative Layout to show five buttons at left ,right, middle, left bottom & right Bottom.



12) Create a Simple application which creates and display ListView of Subject names.



13) Create a simple application which creates Spinner View of Country name.



14) Expense Tracker App:

How can you design an Android app that allows users to record, view, update, and delete daily expenses using SQLite for data storage?

15) Inventory Management System:

How can you create an Android application to manage products in a store, track stock quantity, and record stock in/out transactions using SQLite?

16) Assignment on Installation MongoDB.

17) Assignment on MongoDB shell commands related to create, delete database.

18) Assignment on MongoDB shell commands related to collection, documents.

19) Assignment on MongoDB CURD operation.

20) Assignment on MongoDB Cursor Methods (sort(), Count(), skip(),limit(),pretty()) etc.

21) Assignment on Operators for building queries in MongoDB.

22) Assignment on Pattern Matching in MongoDB.

23) Assignment on Update Operators in MongoDB.

24) Assignment on Delete Commands.

25) Assignment on MongoDB indexing.

26) Assignment on MongoDB Aggregation .

27) Assignment on MongoDB Pipeline.

28) Assignment on Map-Reduce function.

29) Assignment on Monitoring Database Collection, Locks.

30) Case Study.

References:

1. *Professional Android 5 Application Development*, Wiley, 2015.
2. *Beginning Android Programming*, Wiley, 2012.
3. *Android Programming: The Big Nerd Ranch Guide*, 4th Edition, Big Nerd Ranch Guides, 2019.
4. *Android Wireless Application Development,* Addison-Wesley, 2011.
5. https://developer.android.com/docs

Choice Based Credit System Syllabus (2024 Pattern)

Mapping of Program Outcomes with Course Outcomes

Class: T.Y. BBA (C.A) **Subject: BBA (C.A)**

Course Type: Pratical Lab on BBACA-351-MJM & BBACA-354-MJM

Course Code: BBACA-355-MJM

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

COs / POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	3	2	1	1	2	2	1	2	3	1	1	2	3	1
CO2	2	3	3	2	2	3	1	1	1	3	1	1	2	3	1
CO3	2	3	2	2	2	3	1	1	1	3	1	1	1	3	1
CO4	2	3	3	2	2	3	1	1	1	3	1	1	2	3	1
CO5	2	3	3	1	3	3	1	1	1	3	1	2	1	3	1
CO6	2	3	3	1	3	3	1	1	2	3	1	2	2	3	1
CO7	2	3	3	3	3	3	2	1	2	3	2	3	3	3	2

PO1. Knowledge:

CO1, CO2, CO3, CO5, and CO7 are strongly mapped as students gain fundamental understanding of Android architecture, NoSQL concepts, development tools, and database management principles.

PO2. Procedural Knowledge for Skill Enhancement:

CO2, CO3, CO4, CO5, and CO6 are strongly mapped since students learn to apply coding procedures, use Android Studio tools, design layouts, and manage data using SQLite and NoSQL.

PO3. Critical Thinking and Problem-Solving Skills:

CO2, CO4, CO5, and CO6 are strongly mapped because app development and data handling require identifying issues, debugging, and implementing effective solutions.

PO4. Communication Skills:

CO3 and CO7 are moderately mapped as students improve communication through app interface design, documentation, and presentation of projects.

PO5. Analytical Reasoning Skills:

CO4, CO5, and CO6 are strongly mapped because analyzing data flow, performance, and usability strengthens analytical reasoning in app and database operations.

PO6. Innovation, Employability, and Entrepreneurial Skills:

CO6 and CO7 are strongly mapped as students build innovative Android apps and use NoSQL for scalable solutions that enhance employability and entrepreneurial potential.

PO7. Multidisciplinary Competence:

CO2 and CO7 are moderately mapped since Android and NoSQL concepts are applicable across various domains like business, education, and healthcare.

PO8. Value Inculcation through Community Engagement:

CO5 and CO7 are weakly mapped as students can use app development and data tools for community-based and social projects.

PO9. Traditional Knowledge into Modern Application:

CO6 and CO7 are moderately mapped because students apply traditional database concepts in modern NoSQL and mobile development environments.

PO10. Design and Development of System:

CO2, CO3, CO4, CO6, and CO7 are strongly mapped as students design and develop fully functional mobile systems integrating databases and modern UI components.

PO11. Ethical and Social Responsibility:

CO5 and CO6 are moderately mapped since students learn responsible data usage, privacy, and ethical handling of user information.

PO12. Research-Related Skills:

CO5 and CO7 are moderately mapped because app testing and data management foster analytical and research-oriented learning.

PO13. Teamwork:

CO7 is strongly mapped as students collaborate on Android mini-projects, promoting teamwork and shared development responsibility.

PO14. Area Specific Expertise:

CO1, CO2, CO3, CO4, CO5, CO6, and CO7 are strongly mapped as the course builds technical expertise in Android app development and NoSQL database management.

PO15. Environmental Awareness:

CO7 is moderately mapped since developing optimized mobile apps and databases promotes efficient resource and energy usage.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme	**:** BBA (Computer Application)
Programme Code	**:** BBACA
Class	:T.Y.BBA (C.A)
Semester	**:**VI
Course Type	: Major Elective (Theory)
Course Code	: BBACA-356-MJE(A)
Course Title	: Machine Learning
No. of Credits	**:** 02
No. of Teaching Hours	**:** 30

Course Objectives

1. Understand the fundamentals and key concepts of machine learning.
2. Learn major learning types and algorithms—supervised, unsupervised, and semi-supervised.
3. Apply classification, regression, and clustering techniques for data analysis.
4. Explore advanced methods like SVMs and ensemble techniques.
5. Implement machine learning on real datasets with model evaluation and feature selection.

Course Outcomes:

CO1: Explain fundamental concepts, history, applications, and lifecycle of machine learning.
CO2: Distinguish between supervised, unsupervised, and semi-supervised learning and choose suitable algorithms.
CO3: Apply classification and regression techniques on real datasets and evaluate performance.
CO4: Implement SVMs and ensemble methods like bagging, bootstrapping, and random forests for classification.
CO5: Analyze clustering methods—partitioning, density-based, and hierarchical—and interpret results using dendrograms.
CO6: Apply dimensionality reduction techniques like subset selection and PCA to enhance model efficiency.
CO7: Design and evaluate ML solutions demonstrating critical thinking, problem-solving, and research skills..

Topics and Learning Points	Teaching Hours
UNIT-01 Introduction to Machine Learning	**06**
1.1 Introduction to Machine Learning: History of ML Examples of Machine Learning Applications,	
1.2 Learning Types,	
1.3 ML Life cycle,	
1.4 dataset for ML,	
1.5 Data Pre-processing, Training versus Testing, Positive and Negative Class, Cross-validation.	
UNIT-02 Concepts on Learning and its types	**06**
2.1 Types of Learning: Supervised, Unsupervised and Semi-Supervised Learning.	
2.2 Supervised: Learning a Class from Examples,	
2.3 Types of supervised Machine learning Algorithms,	
2.4 Types of Unsupervised Learning Algorithm,	
2.5 Dimensionality Reduction: Introduction to Dimensionality Reduction,	
2.6 Subset Selection and Introduction to Principal Component Analysis.	
UNIT-03 Introduction to Classification	**06**
3.1 Binary and Multiclass Classification: ,	
3.2 Assessing Classification Performance,	
3.3 Handling more than two classes,	
3.4 Multiclass Classification-One vs One, One vs Rest.	
3.5 Regression: Assessing performance of Regression – Error measures, Overfitting and Underfitting, Catalysts for Overfitting, VC Dimensions.	
UNIT-04 Introduction to Support Vector Machine	**06**
4.1 Support Vector Machine classification algorithm,	
4.2 hyper plane, optimal separating hyper planes , kernel functions, kernel selection, applications,	

4.3 Introduction to ensemble and its techniques, Bagging and Bootstrap ensemble methods,

4.4 Introduction to random forest, growing of random forest, random feature selection.

UNIT-05 Overview of clustering and unsupervised learning, 06

5.1 Introduction to clustering methods: Partitioning methods

5.2 Density-Based Spatial Clustering,

5.3 Hierarchical clustering methods: Agglomerative Hierarchical clustering technique,

5.4 Roles of dendrograms and choosing number of clusters in Hierarchical clustering,

5.5 Divisive clustering techniques

References:

1. Tom M. Mitchell, "Machine Learning", India Edition 2013, McGraw Hill Education.
2. S.P. Gupta, "Statistical Methods", Sultan Chand and Sons, New Delhi, 2009,
3. Douglas Montgomery, Elizabeth A. Peck, and G. Geoffrey Vining, "Introduction to Linear Regression Analysis", 5th edition, Wiley publication.
4. Ethem Alpaydin: Introduction to Machine Learning, PHI 2nd Edition-2013

Choice Based Credit System Syllabus (2023 Pattern)
(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: T.Y. BBA (C.A) **Subject**: BBA (C.A)

Course: Machine Learning **Course Code**: BBACA-356-MJE(A)

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

CO-PO Mapping Table

(COs)	PO1	P O2	P O3	P O4	P O5	P O6	P O7	P O8	P O9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15
CO1	3	3	2	1	3	2	1	–	–	3	1	2	1	3	2
CO2	3	3	3	2	3	3	1	–	–	3	1	2	2	3	2
CO3	3	3	3	2	3	3	1	–	–	3	1	3	2	3	2
CO4	3	3	3	2	3	3	1	–	–	3	1	3	2	3	2
CO5	3	3	3	2	3	3	2	–	–	3	1	3	2	3	2
CO6	3	3	3	2	3	3	2	1	–	3	1	3	3	3	2
CO7	3	3	3	3	3	3	2	1	1	3	2	3	3	3	3

PO1: Fundamental Knowledge and Coherent Understanding

CO1–CO7 are strongly mapped as the course provides a strong conceptual foundation in Machine Learning principles, algorithms, and their applications across various domains.

PO2: Procedural Knowledge for Skill Enhancement

CO1–CO7 are strongly mapped since students gain procedural expertise in implementing ML algorithms, using tools like Python/ Scikit-learn, and conducting model evaluations.

PO3: Critical Thinking and Problem-Solving Skills

CO2–CO7 are strongly mapped as designing, training, and optimizing machine learning models require logical reasoning, experimentation, and problem-solving on real-world datasets.

PO4: Communication Skills

CO3, CO6, CO7 are moderately mapped as interpreting model results, visualizing data, and presenting analytical findings enhance communication and technical reporting skills.

PO5: Analytical Reasoning Skills

CO1–CO7 are strongly mapped because the course emphasizes model interpretation, data- driven decision making, and evaluation of algorithmic performance through analytical reasoning.

PO6: Innovation, Employability and Entrepreneurial Skills

CO2–CO7 are strongly mapped since applying ML to domains like business, finance, or healthcare fosters innovation and enhances employability in data science and AI industries.

PO7: Multidisciplinary Competence

CO5–CO7 are moderately mapped as machine learning applications span multiple fields — business analytics, bioinformatics, and social sciences — promoting cross-disciplinary learning.

PO8: Value Inculcation through Community Engagement

CO6, CO7 have weak mapping as the course indirectly supports societal benefit through community-oriented ML projects like healthcare analytics or sustainability prediction systems.

PO9: Traditional Knowledge into Modern Application

CO2, CO3, CO4, CO6, CO7 are moderately mapped because classical statistical techniques are integrated into modern ML frameworks and data-driven technologies.

PO10: Design and Development of System

CO1–CO7 are strongly mapped since students design, develop, and evaluate complete ML solutions, applying system-level thinking to real-world problem contexts.

PO11: Ethical and Social Responsibility

CO5–CO7 are moderately mapped as the course highlights responsible AI practices, ethical data usage, model fairness, and avoidance of algorithmic bias.

PO12: Research-Related Skills

CO5–CO7 are strongly mapped since students learn research methodologies, conduct experiments, evaluate outcomes, and apply findings to data-driven investigations.

PO13: Teamwork

CO5–CO7 are moderately mapped as practical ML projects often involve group work — from data collection and preprocessing to collaborative model development and presentation.

PO14: Area Specific Expertise

CO1–CO7 are strongly mapped because the course builds deep expertise in data analysis, algorithm selection, and predictive modeling—key competencies in AI and Data Science.

PO15: Environmental Awareness

CO6, CO7 are weakly mapped since ML can contribute to sustainable solutions like energy forecasting, crop yield prediction, or pollution analysis, indirectly promoting environmental awareness.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme : BBA (Computer Application)

Programme Code : BBACA

Class : T.Y. BBA (C.A)

Semester : VI

Course Type : Major Elective (Theory)

Course Code : BBACA-356-MJE (B)

Course Title : Big Data

No. of Credits : 02

No. of Teaching Hours :30

Course Objectives:

1. Understand the fundamental concepts, characteristics, and evolution of Big Data.
2. Learn the need for Big Data technologies to manage large and complex datasets.
3. Study Big Data architecture and processing frameworks like Hadoop, HDFS, and MapReduce.
4. Explore data management and analytics using HiveQL and NoSQL tools.
5. Develop practical skills in data processing and analysis using R and Python with Hadoop.

Course Outcomes:

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

CO1: Explain the fundamental concepts, characteristics, and evolution of Big Data.

CO2: Identify the importance of Big Data technologies for managing large and complex datasets.

CO3: Analyze types of digital data and the 5 V's—Volume, Velocity, Variety, Veracity, and Value.

CO4: Describe the architecture and components of frameworks like Hadoop, HDFS, and MapReduce.

CO5: Use HiveQL and NoSQL tools for data management, querying, and analytics.

CO6: Perform data cleaning, transformation, and analysis using Big Data tools.

CO7: Integrate R or Python with Hadoop for Big Data analysis and visualization.

Topics and Learning Points

Unit 1: **Introduction to Big Data** **(05 Lecture)**

1.1 Introduction to Big Data.
1.2 Types of Digital Data.
1.3 Big Data Analytics.
1.4 Application of Big Data.

Unit 2: **Big Data Processing** **(10 Lectures)**

2.1 Big Data Technologies.
2.2 Google File System.
2.3 Hadoop Eco System.
2.4 Hadoop Architecture
2.5 Hadoop Storage: HDFS.
2.6 Hadoop Shell Commands.
2.7 HDFS Read Write Operation, Name Node, Secondary Name Node and Data Node, MapReduce Job, Task Tracker
2.8

Unit 3: **HIVE QL** **(10 Lectures)**

3.1 Data Types and File Formats.
3.2 Databases in Hive.
3.3 Hive QL.
3.4 Data Definition
3.5 Data Manipulation
3.5.1 Queries
3.5.2 Views
3.5.3 Indexes
3.5.4 Schema Design
3.5.5
3.5.6

Unit 4: **Data Analysis Using R And Hadoop** **(05 Lectures)**

4.1 Features of R language
4.2 Architecture of RHIPE
4.3 RHIPE function reference
4.4 Architecture of R Hadoop
4.5 R Hadoop function reference

References:

Reference Books:

1. *Big Data Analytics: Theory and Practice* – David Loshin
2. *Data Science and Big Data Analytics* – EMC Education Services

Web References:

1. https://hadoop.apache.org – Official Hadoop documentation
2. https://hive.apache.org – Apache Hive official site
3. https://www.geeksforgeeks.org/big-data-tutorials – Big Data tutorials

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: T.Y. BBA (C.A) **Subject**: BBA (C.A)

Course: Big Data **Course Code**: BBACA-356-MJE (B)

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

CO-PO Mapping Table

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	2	2	2	2	2	2	1	2	2	1	2	1	2	1
CO2	3	3	2	2	3	2	2	1	2	2	1	2	1	2	1
CO3	3	3	2	2	3	2	2	1	2	2	1	2	1	2	1
CO4	3	3	3	3	3	2	2	1	3	3	1	2	2	3	1
CO5	3	3	3	3	3	3	3	1	3	3	2	3	2	3	2
CO6	3	3	3	3	3	3	3	1	3	3	2	3	2	3	2
CO7	3	2	3	3	3	3	3	1	3	3	2	3	2	3	2

PO1 (Knowledge):

CO1, CO2, CO3, CO4, CO5, and CO6 are strongly mapped because they build foundational understanding of Big Data concepts, frameworks, and tools.

PO2 (Procedural Knowledge):

CO2, CO3, CO4, CO5, and CO6 are strongly mapped since working with Big Data involves hands-on procedural skills for analysis, querying, and data handling.

PO3 (Critical Thinking and Problem-Solving Skills):

CO4, CO5, CO6, and CO7 are strongly mapped because analyzing and processing Big Data requires designing solutions, analytical reasoning, and critical problem solving.

PO4 (Conduct Investigations of Complex Problems):

CO1, CO4, CO5, CO6, and CO7 are strongly mapped as they require exploring large datasets, understanding architecture, and applying analytical methods.

PO5 (Analytical Reasoning Skills):

CO2, CO3, CO4, CO5, and CO6 are strongly mapped as they involve evaluation, classification, and reasoning over large and varied datasets.

PO6 (Innovation, Employability, and Entrepreneurial Skills):

CO5, CO6, and CO7 are strongly mapped since they emphasize practical tool usage, data analysis, and applying programming for Big Data — improving employability.

PO7 (Multidisciplinary Competence):

CO2, CO4, and CO7 are moderately mapped because Big Data tools and frameworks apply across fields like healthcare, marketing, finance, and science.

PO8 (Value Inculcation):

CO1 and CO7 are weakly mapped as ethical data handling and maintenance are important but not the primary focus of the course.

PO9 (Traditional Knowledge into Modern Application):

CO3 and CO4 are moderately mapped as they translate traditional database approaches into modern Big Data applications.

PO10 (Design and Development of Systems):

CO4, CO5, CO6, and CO7 are strongly mapped since they involve designing, developing, and optimizing Big Data systems and analytics pipelines.

PO11 (Ethical and Social Responsibility):

CO1, CO5, and CO7 are moderately mapped as working with Big Data requires consideration of data privacy, security, and ethical practices.

PO12 (Research-Related Skills):

CO1, CO3, CO4, CO5, and CO6 are moderately mapped because analyzing Big Data requires research skills in methodology, tools, and interpretation.

PO13 (Teamwork):

CO5 and CO6 are moderately mapped as Big Data projects often involve teamwork in design, analysis, and implementation stages.

PO14 (Area Specific Expertise):

CO2, CO4, CO5, CO6, and CO7 are strongly mapped since students develop specialized skills in Big Data frameworks, tools, and analytics.

PO15 (Environmental Awareness):

CO6 and CO7 are moderately mapped since Big Data processing impacts energy use, storage, and environmental resources.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2024 Pattern)

Name of the Programme	**:** BBA (Computer Application)
Programme Code	**:** BBACA
Class	**:** T.Y. BBA (C.A)
Semester	**:** VI
Course Type	**:** Major Elective (MJE)
Course Code	**:** BBACA-356-MJE(C)
Course Title	**:** Recent Trends in IT
No. of Credits	**:** 02
No. of Teaching Hours	**:** 30

Course Objectives:

1. To understand recent trends and modern technologies in IT.
2. To learn the concepts and applications of mobile computing.
3. To explore emerging technologies like Blockchain, IoT, Edge & Quantum Computing.
4. To understand the role of Robotics, Smart Systems, and Automation in IT.
5. To study soft computing techniques and their applications.
6. To learn green computing practices for sustainable IT.
7. To understand the environmental impact of IT and eco-friendly innovations.

Course Outcomes:

After successfully completing this course, students will be able to:

CO1. Explain recent IT trends including Blockchain, DevOps, and Industry 4.0.

CO2. Describe mobile computing technologies, OS, and applications.

CO3. Identify and explain emerging technologies and their real-world uses.

CO4. Demonstrate understanding of Blockchain, smart contracts, and cryptography.

CO5. Apply soft computing techniques in optimization and decision-making.

CO6. Evaluate energy-efficient IT practices and green computing methods.

CO7. Discuss environmental concerns and sustainable innovations in IT.

Topics and Learning Points	Teaching Hours

Unit 1:Recent Trends and Technologies in IT **(05 Lecture)**

1.1. Evolution and Trends in Modern IT

1.1.1. Role of new tech in IT evolution

1.1.2. Need for continuous learning

1.1.3. Impact of digital transformation

1.2. Blockchain Technology

1.2.1. What is Blockchain & how it works

1.2.2. Business benefits (security, transparency & decentralization)

1.3. Innovations Driving the Future of IT

1.3.1. IoT: Smart devices & real-time data

1.3.2. Edge Computing: Low-latency processing

1.3.3. Quantum Computing: High-speed problem solving

1.4. Integration of Mobile and Emerging Platforms

1.4.1. Mobile in modern IT systems

1.4.2. BYOD and anytime access

1.5. Industry 4.0 and DevOps in IT Operations

1.5.1. Smart factories & digital twins

1.5.2. DevOps: CI/CD & automation

Unit 2:Mobile Computing **(10 Lectures)**

2.1. Introduction

2.1.1. Definition, features, and importance

2.1.2. Evolution from 1G to 5G networks

2.2. Mobile Network Technologies

2.2.1 GSM, CDMA, LTE, 5G

2.2.2 Network architecture and protocols

2.2.3 5G use cases: IoT, healthcare, autonomous systems

2.3. Mobile Operating Systems

2.3.1. Android and iOS: Overview and key features

2.3.2. App ecosystems and development environments

2.4. Mobile Applications and Services

2.4.1. Types of mobile applications (Native, Web, Hybrid)

2.4.2. Cloud integration for mobile apps

2.5. Emerging Trends in Mobile Computing

2.5.1. IoT integration with mobile devices

2.5.2. AR/VR applications on mobile

2.5.3. Wearable devices and mobile health technologies

Unit 3:Emerging Technologies in IT (10 Lectures)

3.1. Blockchain Technology

3.1.1. Working & architecture

3.1.2. Key techniques: Cryptography, smart contracts

3.1.3. Uses: Finance, healthcare, supply chain

3.2. Internet of Things (IoT)

3.2.1. Structure: IoT architecture, components

3.2.2. Use cases: Healthcare, transport

3.2.3. Issues: Security and privacy challenges

3.3. Robotics and Automation

3.3.1. Types: Industrial robots, autonomous systems

3.3.2. RPA: Software bots for routine tasks

3.3.3. Uses: Manufacturing, logistics, healthcare

3.4. Edge & Quantum Computing

3.4.1. Edge vs Cloud: Speed, location, processing

3.4.2. Quantum basics: Qubits, superposition, entanglement

3.4.3. Applications: Optimization, security, simulations

3.5. Smart Systems

3.5.1. CPS: Integration of physical and digital systems

3.5.2. Tech: Smart factories, digital twins

3.5.3. Cities: IoT-enabled infrastructure and services

Unit 4:Soft and Green Computing (05 Lectures)

4.1. Introduction to Soft Computing

4.1.1. Meaning & principles of Soft Computing

4.1.2. Key techniques: Fuzzy Logic, GA, Neural Networks

4.2. Green Computing Basics

4.2.1. Definition & main goals

4.2.2. Energy-efficient hardware/software design.

4.3. Energy-efficient IT Practices

4.3.1. Lowering energy use in data centers

4.3.2. Sustainable IT practices in workplaces

4.4. Environmental Impact of IT

4.4.1. Managing e-waste and recycling

4.4.2. Cutting down IT carbon footprint

4.5. Recent Trends in Green IT

4.5.1. Data centers using renewable energy

4.5.2. Eco-friendly IoT & mobile strategies

References:

Text Books / Reference Books

1. Mobile Computing*:* Asoke K. Talukder, Roopa R. Yavagal, 2nd Edition
2. Blockchain Basics: A Non-Technical Introduction in 25 Steps: Daniel Drescher, 1st Edition
3. Introduction to the Internet of Things (IoT)*:* Sudip Misra, Anandarup Mukherjee, Arijit Roy, 1st Edition
4. Green IT: Technologies and Applications*:* Alvin Galea, Michael Schur, Mike Ebbers, 1st Edition
5. Soft Computing and Intelligent Systems Design: F. O. Karry, C. G. Johnson, 1st Edition

Web Resources

1. https://iot.ieee.org/articles-publications/?utm_source=chatgpt.com
2. https://link.springer.com/

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: T.Y. BBA (C.A) **Subject:** BBA(C.A.)

Course: Recent Trends in IT **Course Code:** BBACA-356-MJE(C)

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

CO-PO Mapping Table:

COs/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	3	3	-	2	-	2	-	2	3	-	-	1	3	-
CO2	3	3	3	-	2	3	2	-	-	3	-	-	1	3	-
CO3	3	3	3	-	3	3	2	-	-	3	-	-	1	3	-
CO4	3	3	3	-	3	3	-	-	-	3	3	2	1	3	-
CO5	3	3	3	-	3	2	-	-	-	3		2	1	3	-
CO6	3	3	-	-	3	2	-	3	2	3	3	2	1	3	3
CO7	3	-	-	-	3	2	3	3	3	-	3	2	1	-	3

PO1: Fundamental Knowledge and Coherent Understanding

CO1–CO7 All COs strongly mapped as they all relate to multidisciplinary IT concepts—trends, mobile computing, soft computing, sustainability, and green IT—which require a solid foundational understanding across various domains.

PO2: Procedural Knowledge for Skill Enhancement

CO1–CO6 strongly mapped as students gain practical skills in applying emerging IT, mobile networks, soft computing, and energy-efficient systems.

PO3: Critical Thinking and Problem Solving

CO1–CO5 strongly mapped as students are encouraged to analyse real-world IT challenges and emerging technologies, fostering complex problem-solving and critical analysis.

PO5: Analytical Reasoning Skills

CO1 & CO2 moderately and CO3- CO7 strongly mapped as courses like Blockchain, Quantum Computing, Soft Computing, and Green IT demand analytical thinking for evaluation, reasoning, and decisions.

PO6:Innovation, Employability, and Entrepreneurship

CO2 -CO4 strongly mapped and CO5- CO6 moderately mapped as skills in emerging tech, mobile development, Blockchain, and RPA increase employability and entrepreneurial potential.

PO7: Multidisciplinary Competence

CO1-CO3 moderately and CO7 strongly mapped as the integration of IT with environmental science, ethics, industry, and communication demonstrates multidisciplinary learning.

PO8: Value Inculcation through Community Engagement

CO6 & CO7 strongly mapped as topics like Green IT, environmental sustainability, and eco-friendly innovations emphasize community and ethical responsibility.

PO9: Traditional Knowledge into Modern Application

CO1 & CO6 moderately mapped and CO7 strongly mapped as applying sustainable and ethical practices based on traditional values (like minimalism, conservation) to modern IT systems.

PO10: Design and Development of Systems

CO1–CO6 strongly mapped as emerging technologies, Blockchain systems, mobile app integration, soft computing techniques all require system design skills.

PO11: Ethical and Social Responsibility

CO4, CO6, CO7 strongly mapped as ethics in Blockchain, e-waste, carbon footprint, and sustainability tie directly to social and moral responsibility.

PO12: Research-Related Skills

CO4-CO7 moderately mapped as emerging tech, energy efficiency, and sustainability require understanding of research methods and evaluation.

PO13: Teamwork

ALL COs (Indirect) weakly mapped as the group projects or case studies in mobile or green computing may promote teamwork, but not core to the course.

PO14: Area Specific Expertise

CO1–CO6 strongly mapped Specialized knowledge in IT trends, mobile computing, Blockchain, and soft computing reflects subject expertise.

PO15: Environmental Awareness

CO6 and CO7strongly mapped as directly relate to e-waste management, carbon footprint, eco-friendly tech, and sustainability in IT.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application)

(2023 Pattern)

Name of the Programme	**:** BBA (Computer Application)
Programme Code	**:** BBACA
Class	**:** T.Y.Minor
Semester	**:** VI
Course Type	**:** E-Commerce
Course Code	**:** BBACA-361-MN
Course Title	**:** E-Commerce
No. of Credits	**:** 02
No. of Teaching Hours	**:** 30

Course Objectives:

1. Understand WordPress as a CMS.
2. Install, configure, and set up WordPress.
3. Design and develop websites using themes and plugins.
4. Manage content and maintain website security.
5. Apply WordPress for real-world applications like blogs and business sites.

Course Outcomes:

CO1. Explain the features, structure, and functionality of WordPress as a CMS.

CO2. Install, configure, and manage WordPress websites on both localhost and live hosting environments..

CO3. Design responsive websites using pre-built themes and custom templates.

CO4. Integrate plugins and widgets to enhance website functionality and appearance.

CO5. Manage and publish website content effectively using the WordPress dashboard.

CO6. Apply SEO techniques, security measures, and backup strategies for optimal website performance.

CO7. Develop, deploy, and maintain complete WordPress-based projects suitable for academic or professional use.

	Topics and Learning Points	Teaching Hours
Unit I	**Introduction to WordPress**	**(05 Lecture)**
1.1	What is WordPress? Overview and History	
1.2	Understanding CMS and WordPress Ecosystem	
1.3	WordPress.org vs. WordPress.com	
1.4	Installing WordPress (Localhost & Manual Installation)	
1.5	Overview of WordPress Dashboard & General Settings	
Unit II	**WordPress Themes and Plugins**	**(10 Lectures)**
2.1	Understanding Themes and Structure	
2.2	Installing and Customizing Themes	
3.3	Introduction to Plugins: Use, Installation, and Management	
2.4	Recommended Plugins for SEO, Security, and Performance	
2.5	Using Widgets and Shortcodes	
Unit III	**Content Management and Customization**	**(10 Lecture)**
3.1	Posts vs. Pages	
3.2	Creating and Managing Menus, Categories, and Tags	
3.3	Working with Media: Images, Videos, Documents	
3.4	Using Page Builders (Elementor / Gutenberg)	
3.5	Customizing Website Layout and Appearance	
Unit IV	**Deployment, SEO & Maintenance**	**(05 Lectures)**
4.1	Domain and Hosting Setup	
4.2	Migrating Website from Localhost to Live Server	
4.3	Introduction to WordPress SEO (Yoast / Rank Math)	
4.4	WordPress Security & Backup Plugins	
4.5	Website Maintenance and Performance Optimization	

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: TY Minor **Subject:** BBA(C.A.)

Course: E-Commerce **Course Code:** BBACA-361-MN

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

COs/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PO 13	PO 14	PO 15
CO1	3	2	2	2	-	-	-	-	2	2	-	1	1	2	-
CO2	2	3	3	2	2	2	1	-	2	3	1	1	-	3	1
CO3	2	2	3	2	2	2	-	1	3	3	1	-	1	3	-
CO4	2	3	3	2	2	3	1	-	3	3	1	1	-	3	-
CO5	2	2	2	3	2	2	1	2	2	2	2	1	-	2	1
CO6	2	2	3	2	3	3	-	1	3	3	3	-	-	3	2
CO7	3	3	3	3	3	3	1	2	3	3	2	2	2	3	2

PO1: Fundamental Knowledge and Coherent Understanding
CO1–CO4, CO7 strongly relate as they cover conceptual and multidisciplinary understanding of CMS platforms; CO5–CO6 moderately relate through practical application in content management.

PO2: Procedural Knowledge for Skill Enhancement
CO2, CO4, CO7 strongly relate via installation, configuration, and project deployment; CO1, CO3, CO5–CO6 moderately support skill enhancement through structured learning and practice.

PO3: Critical Thinking and Problem-Solving Skills
CO2–CO4, CO6–CO7 strongly relate as students troubleshoot, analyze, and resolve website challenges; CO1, CO5 moderately contribute through problem identification and structured solutions.

PO4: Communication Skills
CO5, CO7 strongly relate in presenting and communicating website content; CO1–CO4, CO6 moderately support documentation and reporting skills.

PO5: Analytical Reasoning Skills
CO6, CO7 strongly relate via website performance analysis and optimization; CO2–CO5 moderately relate through decision-making in web design and management.

PO6: Innovation, Employability, and Entrepreneurial Skills
CO4, CO6, CO7 strongly relate in fostering creativity, innovation, and professional readiness; CO2, CO3, CO5 moderately develop entrepreneurial and innovative mindsets.

PO7: Multidisciplinary Competence
All COs show low relation; WordPress indirectly supports multidisciplinary understanding through integration of design, technology, and communication.

PO8: Value Inculcation through Community Engagement
CO5, CO7 moderately relate as students may design websites for social or educational initiatives; others weakly relate.

PO9: Traditional Knowledge into Modern Application
CO3, CO4, CO6, CO7 strongly relate in presenting traditional/local content digitally; CO1, CO2 moderately relate.

PO10: Design and Development of System
CO2–CO4, CO6, CO7 strongly relate in designing, developing, and deploying websites; CO1, CO5 moderately relate through content management and conceptual understanding.

PO11: Ethical and Social Responsibility
CO6, CO7 moderately to strongly relate as students apply web ethics, security, and responsible publishing; CO1–CO5 weakly to moderately relate.

PO12: Research-Related Skills
CO7 moderately relates in researching themes, plugins, and optimization; CO1–CO6 weakly relate indirectly through exploration.

PO13: Teamwork
CO7 moderately relates in collaborative website projects; CO1–CO6 contribute minimally through design and testing tasks.

PO14: Area Specific Expertise
CO2–CO7 strongly relate in web development, hosting, and digital management; CO1 moderately relates conceptually.

PO15: Environmental Awareness
CO6, CO7 moderately relate through sustainable digital practices like resource optimization; CO1–CO5 weakly relate.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application)

(2023 Pattern)

Name of the Programme	**:** BBA (Computer Application)
Programme Code	**:** BBACA
Class	**:** T.Y.Minor
Semester	**:** VI
Course Type	**:** E-Commerce
Course Code	**:** BBACA-362-MN
Course Title	**:** Practical Lab on Software Tools for Business Communication
No. of Credits	**:** 02
No. of Teaching Hours	**:** 30

Course Objectives:

1. Install and set up WordPress locally and on a live server.
2. Customize themes and use page builders for design.
3. Manage content with posts, pages, and categories.
4. Install plugins for SEO, security, and performance.
5. Deploy WordPress sites and ensure basic SEO and security.

Course Outcomes:

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

CO1: Install and configure WordPress locally and on live servers.

CO2: Design and develop custom themes with CSS and child themes.

CO3: Use plugins for SEO, security, caching, and performance.

CO4: Create and manage content including posts, pages, media, and menus.

CO5: Build responsive layouts using Elementor or Gutenberg.

CO6: Deploy websites from local to live servers.

CO7: Optimize SEO and secure websites using plugins and backups.

Topics and Learning Points	Teaching Hours

Assignment 1: Install WordPress on localhost using XAMPP/WAMP and demonstrate the folder structure and dashboard overview.

Assignment 2: Compare WordPress.com and WordPress.org – list advantages, limitations, and use cases.

Assignment 3: Install and configure a new theme, customize the header, footer, and homepage layout.

Assignment 4: Create a multi-page website for a small business (e.g., café, portfolio, or NGO) using a selected theme.

Assignment 5: Install and activate five useful plugins (SEO, Contact Form, Security, Cache, Backup) and explain their use.

Assignment 6: Design a custom menu with categories and sub-menus. Add relevant posts and pages to each section.

Assignment 7: Add and organize media content (images, videos, PDFs) within posts/pages and apply formatting styles.

Assignment 8: Use Elementor or Gutenberg page builder to create a professional home page layout with sections and buttons.

Assignment 9: Develop a blog website with at least 3 categories and 5 posts. Add featured images and tags.

Assignment 10: Set up a contact form using a plugin (e.g., WPForms or Contact Form 7) and test form submission.

Assignment 11: Register a domain name (use a free domain service) and explain the process of linking it with hosting.

Assignment 12: Migrate a WordPress website from localhost to a live server and verify all links and media.

Assignment 13: Implement SEO optimization using the Yoast SEO plugin — add meta titles, descriptions, and focus keywords.

Assignment 14: Demonstrate security and backup measures using recommended plugins (e.g., Wordfence, UpdraftPlus).

Assignment 15: Create a final mini-project website (personal portfolio, product catalog, or blog) integrating all features learned.

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: TY Minor **Subject:** BBA(C.A.)

Course: Practical Lab on Software Tools for Business Communication

Course Code: BBACA-362-MN

Weightage: 1=weak or low relation, 2=Moderate or partial relation, 3=Strong or direct relation

CO-PO Mapping Table:

COs/PO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PO13	PO14	PO15
CO1	3	3	2	2	2	2	1	1	1	2	2	1	2	3	2
CO2	3	3	3	3	2	3	2	1	1	3	2	1	3	3	2
CO3	3	3	3	2	3	2	1	1	1	3	2	1	2	3	2
CO4	3	2	3	3	2	2	1	1	1	3	2	2	2	3	2
CO5	3	3	3	3	3	3	2	1	1	3	2	2	3	3	2
CO6	3	3	2	2	2	3	2	1	2	3	3	2	3	3	2
CO7	3	3	3	3	3	3	2	1	2	3	3	2	3	3	3

PO1: Fundamental Knowledge and Coherent Understanding

CO1, CO2, CO3, CO4, CO5, CO6, CO7 are strongly mapped as students acquire comprehensive knowledge of website development using WordPress, including installation, theme design, plugins, SEO, and deployment — integrating technical and creative understanding.

PO2: Procedural Knowledge for Skill Enhancement

CO1–CO7 contribute to enhancing procedural skills through hands-on website design, content management, and customization of themes/plugins — improving students' applied technical proficiency.

PO3: Critical Thinking and Problem-Solving Skills

CO2, CO3, CO4, CO5, and CO7 strongly map as learners solve real-time challenges in website development, troubleshoot plugin conflicts, and optimize website performance effectively.

PO4: Communication Skills

CO4 and CO5 are strongly mapped because students learn to structure and present content, enhancing interpersonal and professional communication through effective website interfaces.

PO5: Analytical Reasoning Skills

CO3, CO5, and CO7 align with this PO as students analyze plugin performance, optimize SEO metrics, and evaluate website usability and analytics.

PO6: Innovation, Employability and Entrepreneurial Skills

CO2, CO5, CO6, and CO7 show a strong relation as learners develop employability by creating customized, client-ready websites and exploring freelancing or startup opportunities.

PO7: Multidisciplinary Competence

CO1–CO7 moderately relate, combining IT, marketing, and design principles for holistic understanding of online business systems.

PO8: Value Inculcation through Community Engagement

CO1 and CO7 show a weak relation as students may create websites supporting community, education, or social initiatives.

PO9: Traditional Knowledge into Modern Application

CO1, CO3, and CO7 have weak to moderate relations where traditional content design ideas can be applied in modern digital frameworks.

PO10: Design and Development of System

CO2, CO5, CO6, and CO7 are strongly mapped as students design and deploy fully functional, aesthetic, and responsive websites.

PO11: Ethical and Social Responsibility

CO6 and CO7 moderately map since students ensure website privacy, data protection, and ethical online practices.

PO12: Research-Related Skills

CO3, CO5, and CO7 moderately map by exploring new tools, themes, and plugins, encouraging experimentation and innovation.

PO13: Teamwork

CO2, CO4, CO5, and CO7 map strongly as students collaborate on group projects and web design assignments.

PO14: Area Specific Expertise

CO1–CO7 map strongly since students gain domain-specific expertise in content management, hosting, SEO, and digital marketing integration.

PO15: Environmental Awareness

CO1–CO7 weakly to moderately map by promoting eco-friendly digital presence through optimized and resource-efficient website design.

CBCS Syllabus as per NEP 2020 for T.Y. BBA (Computer Application) (2023 Pattern)

Name of the Programme	**:** BBA (Computer Application)
Programme Code	**:** BBACA
Class	**:** T.Y. BBA (C.A)
Semester	**:** VI
Course Type	**:** On Job Project (Practical)
Course Code	**:** BBACA-385-OJT
Course Title	**:** Practical
No. of Credits	**:** 04
No. of Teaching Hours	**:** 120

Course Objectives:

1. To introduce students to field-based experiential learning.
2. To develop research, data collection, and analysis skills.
3. To enhance problem-solving and critical thinking abilities.
4. To improve communication and teamwork skills.
5. To encourage the application of theoretical knowledge in practical scenarios.

Course Outcomes:

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

CO1: Identify and define a research problem relevant to real-world applications.

CO2: Design and develop an appropriate research methodology, including a questionnaire.

CO3: Conduct fieldwork and collect primary data systematically.

CO4: Analyze and interpret collected data using qualitative and quantitative methods.

CO5: Prepare a structured project report following academic guidelines.

CO6: Develop teamwork, ethical considerations, and professional communication skills.

CO7: Deliver an effective oral presentation, demonstrating clarity and confidence.

Topics and Learning Points

Nature of On-Job Training Program:

A student has to undergo 120 hours of practical training in suitable establishments in consultation with the concerned teacher.

Salient features of On-Job Training Program:

1. The fundamental framework of On-Job Training Program is as below:
2. The on-job training is of four credits and hundred (100) marks.
3. On-Job Training will be of one hundred and twenty clock hours.
4. A student has to complete on-job training in the related subject that he / she has opted in UG.
5. The On-Job Training Program has to be completed in the vacation between semester V and VI.
6. In case of backlog, he/ she can complete the On-Job Training Program prior to appearing for the semester VI examination.
7. Successful completion of the On-Job Training Program is mandatory, in case a student could not complete the On-Job Training as per prescribed standards, he/ she has to undergo the Program again in different establishment.
8. A student is entitled to a 'Completion Certificate' after successful completion of the On-Job Training Program.
9. The On-Job Training provider establishment may select the student for regular employment depending on the skill set and nature of performance exhibited by the student.
10. A student is solely responsible for his behaviour in the business establishment during the on-job training program

Framework of the On-Job Training:

1. The area in which a student has to undergo On-Job Training Program will be finalized by the concerned teacher in consultation with the On-Job Training Program providing organization.
2. This will help a student to have hands - on experience of the important aspects of the Discipline Specific Special Subject chosen by him / her.
3. The contents of the On-Job Training Program should be adequate and a students should be able to understand various concepts and put it into practice within a time frame of 120 hours.
4. On-Job Training Program is of 120 hours net.

Evaluation and credits:

The process of evaluation of On-Job Training Program is structured as below.

The student will prepare a plan for proposed On-Job Training Program. The plan may contain following aspects: -

Sr.No.	Particulars
1	Name of the organization where the On-Job Training is proposed to be carried out.
2	Details of the organization
3	The areas in which he/ she is planning to undergo On-Job Training.
4	Details of the various subject specific concepts learnt by the student before joining the On-Job Training.
5	Allocation of **120 hours** of On-Job Training Program.
6	List of the skills that he/she is planning to acquire during On-Job Training Program.
7	A brief note on how the On-Job Training Program may benefit him/her to develop better skills in his / her subject.
8	Details of the primary discussion that the student had with any officer/ authority of the On-Job Training Program providing organization about the proposed work.
9	Proposed outcome of the On-Job Training Program

Format of Slide wise presentation of work performed by the student during the On-Job

Training program is given below.

Slide No.	Contents
1.	Name of the organization where the On-Job Training was proposed to be carried out.
2.	Contents proposed to be learnt during the On-Job Training Program.
3.	Allocation of **120 hours** of On-Job Training Program.
4.	List of the officers and the staff members of the On-Job Training Providing organization with designations.
5.	Name and designation of the officer under whom the On-Job Training was completed.
6.	Work profile assigned during the On-Job Training Program
7.	Actual work performed during the On-Job Training Program
8.	Skills learnt during the On-Job Training Program
9.	Problems faced while performing the assigned task
10.	How the problems were addressed to
11.	Contribution made towards better functioning the organization, i.e. any techniques invented to save time, manpower or money, improvised documentation process, development of a model for better customer service etc. (Optional)
12.	List of the skills required to perform the assigned task
13.	Opinion of the student about the following - 1. Utility of the On-Job Training 2. Adequacy of the time allotted for program 3. Suggestions for improvement 4. Will the program improve employability? 5. Suggestions to make the On-Job Training program more meaningful and effective 6. Overall feedback about the On-Job Training experience 7. Any other information

Students need to submit following documents at the time of final evaluation of the work performed during the On-Job Training Program:-

1. On-Job Training Completion Certificate (Format Enclosed)
2. Duly signed and completed Log Sheet stating hour wise work done. (Format Enclosed)
3. Feedback form duly signed and stamped by the On- Job Training provider organization. (Format Enclosed)
4. Student Feedback form (Format Enclosed)

Evaluation of the Proposal :

a. The student is supposed to prepare a PowerPoint Presentation covering the above aspects.

b. The evaluation is to be done on the basis of the

i. Regularity and punctuality

ii. Actual work performed,

iii. Feedback by the On-Job Training providing organisation

iv. Nature of contribution made

v. Skills learnt

vi. Problem solving initiative taken

vii. Learning attitude.

c. The evaluation panel will consist of two examiners. Industry experts may be invited to evaluate the proposal and make suggestion, if any.

d. Total evaluation of the proposal will be of 100 marks and it carries 4 credits.

e. Minimum marks required for passing are 40.

Formats required for On-Job Training program:

1. **Letter to On-Job Training Providing Organization for inclusion of students**
2. **Undertaking from student about his/ her behavior to the college**
3. **Undertaking from student about his/ her behavior to the organization**
4. **Log Sheet of work performed during On-Job Training**
5. **On-Job Training completion certificate**
6. **Feedback from On-Job Training provider organization Feedback from student**

Choice Based Credit System Syllabus (2023 Pattern)

(As Per NEP 2020)

Mapping of Program Outcomes with Course Outcomes

Class: TYBBA (C.A) (Sem VI) Subject: BBA (C.A)

Course: On Job Training Course Code: BBACA-385-OJT

Weightage: 1= weak or low relation, 2= moderate or partial relation, 3= strong or direct relation

	Programme Outcomes (POs)														
Course Outcomes	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PO13**	**PO14**	**PO15**
CO	3	2	3	2	3	2	2	2	1	3	2	3	2	3	2
CO2	3	3	3	2	3	3	2	2	1	3	2	3	2	3	2
CO3	3	3	3	2	3	2	2	2	1	2	2	3	2	3	2
CO4	3	3	3	2	3	2	2	2	1	2	2	3	2	3	2
CO5	3	3	2	3	2	2	2	2	1	2	3	3	3	3	2
CO6	3	3	3	3	3	3	2	2	1	2	3	3	3	3	2
CO7	3	3	3	3	2	2	2	2	1	-	-	-	-	-	-

PO1: A Fundamental Knowledge and Coherent Understanding

CO1–CO7 strongly relate as students integrate multidisciplinary knowledge in identifying and defining research problems, designing methodology, and interpreting results in various fields like Management, Marketing, Finance, and Computer Applications.

PO2: Procedural Knowledge for Skill Enhancement

CO2–CO6 are strongly mapped since students develop procedural skills such as creating questionnaires, collecting data, and preparing structured reports using research tools and techniques.

PO3: Critical Thinking and Problem-Solving Skills

CO1–CO4, CO6, and CO7 strongly contribute as students critically analyze real-world problems, collect relevant data, and derive logical conclusions through systematic investigation.

PO4: Communication Skills

CO5–CO7 are strongly mapped because students present findings effectively through written reports and oral presentations, enhancing their interpersonal and professional communication skills.

PO5: Analytical Reasoning Skills

CO1–CO4 are strongly mapped since students analyze, interpret, and validate data to draw meaningful insights using quantitative and qualitative methods.

PO6: Innovation, Employability and Entrepreneurial Skills

CO2, CO5, and CO6 are strongly mapped as students develop innovative thinking and professional skills that enhance employability and prepare them for entrepreneurial ventures based on research insights.

PO7: Multidisciplinary Competence

CO1–CO7 moderately map because research work involves integrating multiple disciplines such as statistics, business, economics, and computing to develop comprehensive solutions.

PO8: Value Inculcation through Community Engagement

CO3–CO6 moderately relate since students conduct socially relevant research, promoting ethical practices and awareness towards community issues and sustainable development.

PO9: Traditional Knowledge into Modern Application

CO1–CO3 have weak to moderate relation as traditional data collection and analysis methods are adapted into modern research practices and tools.

PO10: Design and Development of System

CO1–CO4 strongly relate because students design systematic research processes, develop models, and apply structured methodologies to address specific research objectives.

PO11: Ethical and Social Responsibility

CO5–CO7 are strongly mapped as students maintain integrity, transparency, and ethical standards while conducting and presenting research.

PO12: Research-Related Skills

CO1–CO7 show a strong mapping since the entire course focuses on research design, data collection, analysis, and report writing, building strong research competence.

PO13: Teamwork

CO6 and CO7 are strongly mapped as students collaborate in groups for data collection, report writing, and presentations, demonstrating coordination and mutual respect.

PO14: Area Specific Expertise

CO1–CO5 are strongly mapped because research projects are based on domain-specific topics from Marketing, Finance, HR, or IT, enhancing expertise in those areas.

PO15: Environmental Awareness

CO3–CO6 show weak to moderate relation as students may conduct research that considers sustainability, environmental practices, or organizational eco-initiatives.