Savitribai Phule Pune University, Pune

Faculty of Commerce and Management

Bachelor of Commerce in Computer Application

(B.Com. - CA)

Revised Curriculum (2024 Pattern as per NEP-2020)

w.e.f. Academic Year: 2024-2025

Programme Structure

FYBCOM-CA Semester II							
Course Type	Course	Paper Title	Hours / Week	Credits	Internal	External	Total
Major Mandatory (06)	Major Mandatory 4	Advance C Programming	3	2	15	35	50
	Major Mandatory 5	Relational Database Management System (RDBMS)	3	2	15	35	50
	Major Mandatory 6 (Practical)	Computer Laboratory based on Advance C and RDBMS	5	2	15	35	50
Minor	Minor 1	Organizational Behavior	3	2	15	35	50
Open Elective (OE)	Open Elective 3	Business Statistics - I	3	2	15	35	50
	Open Elective 4	Introduction to Data Science	3	2	15	35	50
Vocational Skill Development Course (VSC)	Vocational Skill Development Course (VSC) (Practical)	Web Technology	5	2	15	35	50
Skill Enhancement Course (SEC)	Skill Enhancement Course (SEC)	E-Commerce	3	2	15	35	50
Ability Enhancement Course (AEC)	Ability Enhancement Course (AEC)	Business Communication Skills-II	3	2	15	35	50
Value Education Course (VEC)	Value Education Course (VEC)	Democracy Awareness & Gender Sensitization	3	2	15	35	50
Co-Curricular Courses (CC)	Co-Curricular Courses (CC)	Physical Education – II	@ Department	2	50	35	50
		Total	-	22	165	385	550

Detail Syllabus

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	ACP201T	Major Mandatory	Advance C Programming	02	03

Course Objectives:

1. To provide advanced features in C Programming in problem solving.
2. To learn advanced data types in C programming to solve problems.
3. To understand built-in library functions

Course Outcome:

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

CO1	**write C programs using pointers, structures and unions**
CO2	**create Pre-processor directives.**
CO3	**perform strings using library functions**
CO4	**write C programs using pointers, structures and unions**

Unit	Title and Contents	No. of Lectures
1	**Array, String and Pointers:** 1.1 Introduction to Array 1.1.2 Array Declarations, 1.1.2 Bounds Checking 1.2 Types: 1.2.1 Single dimension, 1.2.2 Two dimension 1.3 Arrays & Function 1.4 Introduction to String 1.4.1 Declaration 1.4.2 Definition 1.4.3 Initialization 1.4.4 format specifiers 1.5 Reading & writing from & to console 1.6 Strings & pointers 1.6.1 Array of strings & array of character pointers 1.6.2 Predefined functions, User defined functions 1.7 Introduction to pointers 1.7.1 Declaration 1.7.2 Definition 1.7.3 Initialization & use 1.7.4 Types of pointers 1.7.5 Pointer Arithmetic 1.7.6 Multiple indirection 1.7.7 Parameter passing – call by value and call by reference	**15**

	1.8 Pointer to array 1.8.1 Array of pointers 1.9 Functions & pointers 1.9.1 Passing pointer to function 1.9.2 Returning pointer from function 1.10 Dynamic memory Allocation malloc( ), calloc( ), free( ), realloc( ) functions	
2	**Structures** 2.1 Introduction 2.1.1 Declaration 2.1.2 Definition 2.1.3 Initialization 2.2 Accessing structure members (. operator) 2.3 Array of structures 2.4 Pointers to structures 2.4.1 Declaring pointer to structure 2.4.2 Accessing structure members 2.5 Structures & functions 2.6 Passing each member of structure as a separate argument 2.7 Passing structure by value / address Nested structures 2.8 Union 2.8.1 Declaration of union Accessing structure members 2.9 Difference between Structures and Union Preprocessor and File Handling 2.10 Preprocessor Introduction 2.11 Format of preprocessor directives 2.12 File inclusion directives (#include), Macro substitution directives (#define), nested macros, parameterized macros. 2.13 File Handling Concept of streams, need 2.14 Types of files, Operations on text & binary files, Random access file 2.15 library functions for file handling – fopen, fclose, fgetc, fseek, fgets, fputcetc	**15**

Reference Books

1. How to Solve it by Computer, R.G. Dromey, Pearson Education.
2. Problem Solving and Programming Concept, Maureen Sprankle,7thEdition, Pearson Publication.
3. C: the Complete Reference, Schildt Herbert, 4 th edition, McGraw Hill
4. A Structured Programming Approach Using C, Behrouz A. Forouzan, Richard F. Gilberg, Cengage Learning India
5. The ‘C’ programming language, Brian Kernighan, Dennis Ritchie, PHI
6. Programming in C ,A Practical Approach, Ajay Mittal , Pearson
7. Programming with C, B. Gottfried, 3rd edition, Schaum’s outline Series, Tata McGraw Hill.
8. Programming in ANSI C, E. Balagurusamy, 7th Edition, McGraw Hill.

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	RDB202T	Major Mandatory	Relational Database Management System	02	03

Course Objectives:

1. To understand the basic concepts and the applications of RDBMS.
2. Enables student to write PL/SQL programs that use procedure, function, package, cursor and trigger

Course Outcome:

Student will be able to

CO1	understand the concept of Relational Database Management System.
CO2	develop PL/SQL programs, functions, procedures, triggers, cursors, packages etc.
CO3	understand Transaction management and concurrency control.

Unit	Title and Contents	No. of Lectures
1	**Introduction to RDBMS and PL-SQL** 1.1 Introduction to RDBMS 1.1.1 Difference between DBMS and RDBMS 1.1.2 Advantages and Disadvantages of RDBMS 1.2 Overview of PLSQL 1.2.1 Data Types 1.2.2 PLSQL Block 1.2.3 Variables, Constant 1.2.4 Operator 1.3 Control Statement 1.3.1 Conditional Control 1.3.2 Looping Control 1.3.3 Sequential Control 1.3.4 Case Statement 1.4 Exception Handling 1.4.1 Structure of Exception Handling 1.4.2 Types of Exception 1.4.3 Handling Exception 1.5 Functions 1.5.1 Create a Function 1.5.2 Calling a Function 1.6 Procedures 1.6.1 Creating a Procedure 1.6.2 Executing a Standalone Procedure 1.7 Cursor 1.7.1 Attributes of Cursor 1.7.2 Types of Cursors 1.8 Trigger	10

	1.8.1 Types of Triggers 1.8.2 Different Operation on Triggers 1.9 Package 1.9.1 Characteristics of PL/SQL Package 1.9.2 Advantages of PL/SQL Packages	
2	**Transaction Management** 2.1 Transaction Concept 2.1.1 Transaction Concept 2.1.2 ACID Properties 2.1.3 Transaction State 2.1.4 Transaction Operation 2.2 Schedule 2.2.1 Serial Schedule 2.2.2 Concurrent Schedule 2.3 Serializability 2.3.1 Conflict Serializability 2.3.2 View Serializability 2.3.3 Testing for Serializability 2.4 Recoverability 2.4.1 Recoverable Schedules 2.4.2 Cascade less Schedules	**10**
3	**Concurrency Control & Recovery System** 3.1 Lock Based Protocol 3.1.1 Lock 3.1.2 Locking Protocol 3.1.3 Locking Techniques for Concurrency Control 3.1.4 Granting of Locks 3.1.5 Two-Phase Locking Protocol 3.2 Timestamp Based Protocol 3.3 Deadlock Handling 3.3.1 Deadlock 3.3.2 Techniques of Deadlock Handling 3.3.3 Deadlock Prevention 3.3.4 Deadlock Detection 3.3.5 Deadlock Recovery 3.4 Failure Classification 3.5 Recovery & Atomicity 3.6 Recovery with concurrent transaction	**10**

Reference Books:

1. Database System Concepts by Henry Korth and A. Silberschatz
2. SQL,PL/SQL The Programming Language Oracle:- Ivan Bayross, BPB Publication.
3. Database Systems Concepts, Designs and Application by Shio Kumar Singh, Pearson
4. Introduction to SQL by Reck F. Vander Lans by Pearson
5. Modern Database Management by Jeffery A Hoffer, V. Ramesh, Heikki Topi, Pearson
6. Database Management Systems by Debabrata Sahoo, Tata Mac Graw Hill

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	LAB203L	Major Mandatory (LAB)	Computer Laboratory based on Advance C and RDBMS	02	05

This course is a Practical Course based on Advance C and RDBMS. The college/institute has given an autonomy to design assignments based on following guidelines

1. Practical Assignments based on Arrays, Strings and Pointers – 10
2. Practical Assignments based on Structures – 5
3. Practical Assignments based on basic PL/SQL commands – 10
4. Practical Assignments based on advanced PL/SQL commands - 5

Semester No.	Course Code	Type of Course	Course Title	Credits	Lecture Hours/ Week
II	OB201T	Minor	Organizational Behaviour	2	3

Course Objectives	
1.	To familiarize the students with the basic concepts of Individual Behavior and organizational behavior
2.	To provide students with a comprehensive exposure to Organizational behaviour, Perception and workplace issues.
3.	To acquire knowledge regarding the organizational change, development and Group Behavior.

Course Outcome Student will be able to	
CO1	Understand the different concepts of Organisational Behaviour
CO2	Understand and deal with organizational change and development.
CO3	Able to analyse individual and group behaviour
CO4	Understand the different concepts of Organisational Behaviour

Unit	Title and Contents	No. of Lecture Hours
1	**Introduction to Organization Behaviour and Individual Behavior** 1.1 Definition, Scope and Importance. 1.2 Disciplines contributing to OB. 1.3 Models of OB- Autocratic, Collegial, Custodial and Supportive 1.4 Personal factors, environmental factors, organizational systems and resources. 1.5 Personality: determinants of personality, personality and OB. 1.6 Perception: Perceptual process, Attitude, values and OB. 1.7 Motivation: Nature and importance of motivation, theories of motivation, Maslow's theory, Herzberg theory, Theory X and Theory Y.	15
2	**Group & Organisational Dynamics** 2.1 Group Dynamics- Groups and Teams, Types, Reasons for forming Groups, Stages in Group Development, Group Behaviour, Group Cohesiveness 2.2 Conflict - Meaning, Definition, Traditional & Modern View of Conflict, Conflict Management- Competing, Collaborating, Compromising, Avoiding, Accommodating. 2.3 Leadership- Meaning, Definition, Leadership Styles	15

	2.4 Organisational Dynamics - Organisational Culture- Meaning, Definition, Levels, Formation & Sustaining Organisational Culture 2.5 Organisational Change- Meaning, Definition, Types, Forces for Change in Organisation, Resistance to Change, Management of Change	

Reference Books

1. **K. Aswathappa: Organizational Behaviour, Himalaya Publishing house, Mumbai.**
2. **Robin. S. P: Organizational Behaviour, Pearson Education, India.**
3. **Suja R Nair: Organisational Behaviour: Text & Cases, Himalaya Publishing House, Mumbai.**
4. **S.S. Khanna: Organisational Behaviour, S. Chand & Co, New Delhi**
5. **Dr Anjali Ghanekar: Organizational behaviour Concepts and cases, Everest Publishing House, Pune.**

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	OE-103-STS	Open Elective	Business Statistics - I	02	03

Note: This course is for FYBCOM-CA students and taken from OE basket of Faculty of Science and Technology

Course Objectives	
1.	To understand role and importance of statistics in various business situations
2.	To develop skills related with basic statistical technique
3.	To learn some elementary statistical methods for data collection, presentation and analysis of data.
4.	To develop right understanding regarding data interpretation
5.	To familiarize the students with applications of Statistics in Business and Management

Course Outcome	
CO1	understand basic concepts in statistics
CO2	collect, present, analyze and interpret the data and graphs
CO3	deal data in business problems
CO4	evaluate feasibility business problems using statistical techniques
CO5	prepare business report using various statistical techniques

Unit	Title and Contents	No. of Lecture Hours
1	Frequency Distribution 1.1 Raw data, variable, discrete variable, continuous variable, constant, attribute with illustration. 1.2 Classification- Concept and definition of classification, objectives of classification, types of classification. 1.3 Frequency Distribution- Discrete and Continuous frequency distribution, Cumulative frequency and Cumulative frequency distribution.	**10**

	1.4 Graphs & Diagram- Histogram, Ogive curve, Pie-Diagram, Bar Diagram, Multiple bar Diagram, Sub-divided bar diagram	
2	Measure of Central Tendency 2.1 Concept and meaning of Measure of Central Tendency, Objectives of Measure of Central Tendency, Requirements of good Measure of Central Tendency. 2.2 Types of Measure of Central Tendency, Arithmetic Mean (A.M), Median, Mode for discrete and Continuous frequency distribution, Merits & Demerits of A.M., Median, Mode, Numerical Problem. 2.3 Determination of Mode and Median graphically. 2.4 Empirical relation between mean, median and mode. 2.5. Combined Mean 2.6. Numerical Problems	**10**
3	Measure Dispersion Concept of Dispersion, Measures of Dispersion - Range, Variance and Standard Deviation (S.D.) for Grouped and ungrouped data, Measures of relative dispersion- Coefficient of range and coefficient of Variation, Examples.	**10**

Sr. No	Title of the Book	Author/s	Publication	Place
1.	Business Mathematics and Statistics -I	Dr. M. P. Waghmare	Thakur Publication	Pune
2.	Business Statistics	Girish Phatak	Tech – Max	Pune
3.	Statistics for Business	Dr. S. K. Khandelwal	International Book House	New Delhi
4.	Fundamentals of Business Statistics	J.K. Sharma	Pearson	New Delhi
5.	Business Statistics	G.C. Beri	The McGraw-Hill companies	New Delhi

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	OE-101-CA	Open Elective	Introduction to Data Science	02	03

Note: This course is for FYBCOM-CA students and taken from OE basket of Faculty of Science and Technology

Course Objectives	
1.	To understand need of Data Science
2.	To Know role of Statistics in Data Science
3.	To know Data Science Models and Tasks

Course Outcome Student will be able to	
CO1	define Data Science Tasks and Models and Lifecycle
CO2	apply Prep-processing and visualization Techniques

Unit	Title and Contents	No. of Lecture Hours
1	**Introduction** What and why learn Data Science? Types of Data -structured, semi-structured, unstructured Data Applications of Data Science, The Data Science Lifecycle, Role of Data Scientists Data sources-Open Data, Social Media Data, Multimodal Data, standard datasets	**06**
2	**Statistics for Data Science** Data Objects and Attributes, Attribute Types: Nominal, Binary, Ordinal Attributes, Numeric Attributes, Discrete versus Continuous Attributes, Role of statistics in Data Science Descriptive statistics - Measuring the Frequency, Measuring the Central Tendency: Mean, Median, and Mode, Measuring the Dispersion: Range, Standard deviation, Variance, Inter quartile Range	**06**
3	**Data science Models and Tasks**	**06**

	Predictive and Descriptive Models, Introduction to Data Science Tasks – Classification, Prediction, Association, Clustering, Performing simple Data Science Tasks using WEKA / R	
4	**Data Quality and Pre-processing** Data Quality: Why Preprocess the Data? Data munging/wrangling operations Data Cleaning - Missing Values, Noisy Data Data Transformation – Rescaling, Normalizing, Data reduction and Data discretization	**06**
5	**Data Visualization** Introduction to Exploratory Data Analysis (EDA), Data visualization, Basic data visualization tools –Box Plots, Histograms, Bar charts/graphs, Scatter plots, Line charts, Area plots, Pie charts	**06**

Reference Books:

1. Data Science Fundamentals and Practical Approaches, Gypsy Nandi, Rupam
2. Sharma, BPB Publications, 2020.
3. Data Mining Concepts and Techniques, Third Edition, Jiawei Han, Micheline
4. Kamber, Jian Pei, Morgan Kaufmann, 2012.
5. A Hands-On Introduction to Data Science, Chirag Shah, University of Washington
6. Cambridge University Press

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	VEC201CA	VSC	Web Technology	02	03

Course Objective:

1. To know and understand the concept of web designing.
2. To understand how to develop web-based applications using HTML and CSS

Course outcome:

Student will be able to

CO1	get acquainted with website designing.
CO2	develop static web site using HTML and CSS.

Unit	Title and Contents	No. of Lectures
1.	**HTML** 1.1 Introduction to HTML 1.2 Basic HTML Structure 1.3 Common HTML Tags 1.4 Physical and Logical HTML 1.5 Types of Images, client side and server-side Image mapping 1.6 List, Table, Frames 1.7 Embedding Audio, Video 1.8 HTML form and form elements	10
2.	**Style sheets** 2.1 Need for CSS 2.2 Introduction to CSS 2.3 Using CSS 2.4 Array in Java scripts background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS 2.5 Overview and features of CSS2 and CSS3	10
3	**JavaScript** 3.1 Introduction to Java Script 3.2 Identifier & operator, control structure, functions 3.3 Predefined functions, math & string functions 3.4 Array in Java scripts	10

Reference Books:

1. Complete HTML-Thomas Powell
2. HTML and Java Script–Ivan Bayross
3. HTML& CSS: The Complete Reference, Fifth Edition
4. Mastering HTML, CSS & Java script Web Publishing

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	SEC201CA	SEC	E-Commerce	02	03

Course Objectives:

1. To acquaint the learner with knowledge on the basics of E-commerce.
2. To develop knowledge on various types of E-commerce business.
3. To Develop knowledge on various modes of online transaction for crating convenience in day-to-day financial transactions and promoting cashless economy.
4. To introduce the learner to the concept of Electronic Data Inter exchange and its significance.

Course Outcome:

Student will be able to

CO1	develop knowledge on various types of E-commerce business.
CO2	develop knowledge on various modes of online transaction for crating convenience in day-to-day financial transactions and promoting cashless economy.
CO3	Understand the various forms of ecommerce

Unit	Title and Contents	No. of Lectures
1	**Introduction to Electronic Commerce** 1.1 What is E-Commerce (Introduction and Definition) 1.2 Main activities E-Commerce 1.3 Goals of E-Commerce 1.4 Technical Components of E-commerce 1.5 Functions of E-commerce 1.6 Advantages and Disadvantages of E-commerce 1.7 Scope of E-commerce 1.8 Electronic commerce Applications 1.9 Electronic commerce and Electronic Business 1.10 (C2C)(2G , G2G , B2G , B2P,B2A,P2P, B2A, C2A, B2B,B2C)	**12**
2	Electronic payment System 2.1 Introduction 2.2 Types of Electronic payment system 2.3 Payment types 2.4 Traditional payment 2.5 Value exchange system 2.6 Credit card system 2.7 Electronic funds transfer 2.8 Paperless bill 2.9 Modern payment cash 2.10 Electronic cash	**08**
3	**E-com Security** 3.1 E-commerce security environment 3.2 Security threats in E-com environment 3.3 Malicious code and unwanted programs 3.4 Hacking and cyber vandalism 3.5 Credit card fraud/Theft	**10**

	3.6	Spoofing	
	3.7	Denial of service(DOS)	
	3.8	Distributed denial of service(dDOS)	

Reference Books:

1 Internet marketing and E-commerce-Ward Hanson and Kirthi Kalyanam
2 E-Commerce Concepts , Models , Strategies by -- G.S.V Murthy
2 Electronic Commerce by --Gary P. Schneider
3 E-Commerce- Kenneth C. Laudon and Carol Guercio Traver
4 E-Commerce by --Kamlesh K Bajaj and Debjani Nag

Semester No.	Subject Code	Type of Course	Course Title	Credits	Lectures per week
II	AEC201CA	AEC	Business Communication Skills-II	02	03

Course Objectives:

1. Develop the skills needed for approaching different types of interviews.
2. Help the students in developing effective presentation skills.
3. Enhance the skills of public speaking amongst students.
4. Enable students to understand their own strengths and weaknesses, opportunities, and challenges.

Course Outcome:

Student will be able to

CO1	Improve oral communication and presentation skills.
CO2	Understand and deal with different types of interviews.
CO3	Students can learn how to identify their strengths and weaknesses, and how to focus on improving those areas.

Unit	Title and Contents	No. of Lectures
1	**Oral Communication** 1.1 Definition, merits and demerits. 1.2 Presentation skills: Preparation for self-introduction and effective presentation. Overcoming fear during presentation. 1.3 Interview skills: Interview and types of interviews. Preparation before, during and after an interview . 1.4 Do's and Don'ts in an interview	15
2	**Personality Development and communication skills.** 2.1 The concept of personality - Factors affecting personality development , Importance of Personality Development. 2.2 Self Awareness – Meaning – Benefits of Self – Awareness – Developing Self – Awareness. 2.3 Attitude : meaning and types, Factors affecting attitudes ,Positive attitude – Advantages, Negative attitude- Disadvantages ,Ways to develop positive attitude 2.4 Self SWOC Analysis – Meaning – Importance-Application .	15

References

1. Business Communication, R.K. Madhukar, Vikas Publishing House
2. Business Communication, Homai Pradhan, N.S. Pradhan, Himalaya Publishing House
3. Business Communication, K.K. Sinha, Taxman Publications

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	VEC201CA	VEC	Democracy Awareness and Gender Sensitisation	02	03

Course Objectives:

1. To make students understand the fundamental principles of democracy and their relationship with gender.
2. To foster democratic values like tolerance and empathy in students to tackle gender-based issues and become active, informed citizens.
3. To encourage critical thinking by making students aware of their biases and create readiness for diversity and inclusion.

Course Outcome:

Student will be able to

CO1	Students will understand the fundamentals of democracy, including equality, justice and human rights and will be able to challenge negative attitudes and stereotypes about all genders (various gender identities identified in contemporary society).
CO2	Students will develop empathy and understanding democratic values and can develop a sense of responsible citizenship and healthy relations.
CO3	Students will develop critical thinking and analytical skills, fostering them to evaluate democratic issues and can create increased readiness for diversity and inclusion.
CO4	Students will be inspired to become active citizens, by engaging in democratic processes.

Unit	Title and Contents	No. of Lectures
1	**Introduction to Democracy and democratic values and principles** • Types of democracy, Democracy, and constitution, Understanding democratic Values & Principles • Indian political system - legislature, executive, judiciary • Federal structure - central and state government, role of political parties and pressure groups in democracy • Duties of citizens and government & Future of democracy	05
2	**Challenges to Democracy and corrective measures**. • Illiteracy, poverty, gender discrimination, casteism, communalism, corruption, criminalization in politics, violence etc.	08

	• Strengthening Democracy- Education and sensitization, Technological innovations- E-governance, digital participation etc.	
3	**Understanding gender-related concepts, gender-based violence and democracy** • Gender roles, social construction of Gender • Patriarchal family structure and its effects • The democratic deficit in the form of women's participation and governance • Strategies to address deficit – Promoting Gender Equity and Equality	**08**
4	**Addressing challenges** • Breaking gender stereotypes in families • Empowering women's representation in society • Men's participation in advocating gender equality, • Setting the approach of Reciprocity for the betterment of every individual	**09**

Reference Material

1. https://ncert.nic.in/textbook.php?iess4=0-5
2. Democratic Politics – Text book in political science std IX
3. https://nios.ac.in/media/documents/SecSocSciCour/English/Book2.pdf
4. National Institute of Open Schooling – Social Science
5. https://maharashtraboardsolutions.com/maharashtra-state-board-class-11-political-science-solutions/
6. MHBSHC- Standard 11 – Political Science
7. Gramin Vikas Mantralay Bharat Sarkar – Gender module
8. NATIONAL COMMISSION FOR WOMEN NEW DELHI - 'Gender Sensitization and Legal Awareness Programme

Semester No.	Course Code	Type of Course	Course Title	Credits	Lectures per week
II	CC201CA	Co-Curricular (CC)	Physical Education - II	02	03

Details syllabus and execution guidelines for Physical Education will be shared separately