Dr. Babasaheb Ambedkar Marathwada University, Aurangabad

Curriculum Structure and Scheme of Evaluation: B.C.A.(Sci.)

Sr. No.	Paper Number	Name of the Paper Titles	Scheme of Teaching	Scheme of Evaluation(Marks)		
			Theory / Practical (Lect. /week)	Theory / Practical (Marks)	Exam Duration (in hrs.)	Total Marks
I Semester						
1	CA101-T	Computer Fundamentals	3	50	2	50
2	CA102-T	Digital Electronics	3	50	2	50
3	CA103-T	Microprocessor - I	3	50	2	50
4	CA104-T	C Programming – I	3	50	2	50
5	CA105-T	Communication Skill – I	3	50	2	50
6	CA106-T	Mathematical Foundation	3	50	2	50
7	CA107-P	Office Suite	4	50	2	50
8		C Programming – I	4	50	2	50
9	CA108-P	Microprocessor – I	4	50	2	50
10		Digital Electronics	4	50	2	50
II Semester						
1	CA201-T	Data Structure	3	50	2	50
2	CA202-T	Operating System	3	50	2	50
3	CA203-T	I.T.Tools& Web Designing I	3	50	2	50
4	CA204-T	C Programming – II	3	50	2	50
5	CA205-T	Communication Skill – II	3	50	2	50
6	CA206-T	Numerical Computation Methods	3	50	2	50
7	CA207-P	Data Structure	4	50	2	50
8		I.T.Tools&Web Designing I	4	50	2	50
9	CA208-P	C Programming – II	4	50	2	50
10		Numerical Comp. Methods	4	50	2	50

Sr. No.	Paper Number	Name of the Paper Titles	Scheme of Teaching	Scheme of Evaluation(Marks)		
			Theory / Practical (Lect /week)	Theory / Practical (Marks)	Exam Duration (in hrs.)	Total Marks
III Semeste						
1	**CA301-T**	Database Management System	3	50	2	50
2	**CA302-T**	Mobile Maintenance-I	3	50	2	50
3	**CA303-T**	Principal of Management	3	50	2	50
4	**CA304-T**	Programming in CPP	3	50	2	50
5	**CA305-T**	Personality Development	3	50	2	50
6	**CA306-T**	Statistical Method	3	50	2	50
7	**CA307-P**	Programming in C++	4	100	2	100
8		DBMS	4		2	
9	**CA308-P**	Mobile Maintenance-I	4	100	2	100
10		Statistical Method using Excel	4		2	

Sr. No.	Paper Number	Name of the Paper Titles	Scheme of Teaching	Scheme of Evaluation(Marks)		
IV Semester						
1	**CA401-T**	Advance DBMS	3	50	2	50
2	**CA402-T**	Mobile Maintenance-II	3	50	2	50
3	**CA403-T**	Software Project Management	3	50	2	50
4	**CA404-T**	Core Java	3	50	2	50
5	**CA405-T**	Aptitude and Logical Reasoning	3	50	2	50
6	**CA406-T**	Linear Programming Problem	3	50	2	50
7	**CA407-P**	Programming in Java	4	100	2	100
8		Adv. DBMS using SQL	4		2	
9	**CA408-P**	Mobile Maintenance-II	4	100	2	100
10		Mini Project	4		2	

B.C.A.(Science)

Semester –III

1   Unit – I: Basic Concept
- Data Definition, Types of Data, Record and File, File based System & Processing
- Database System Application, Purpose of Database System
- Abstraction & Data Integration
- Three level Architecture proposal for a DBMS.
- Component of a DBMS: Users, Facilities &Structure.
- Advantageous & Disadvantageous of DBMS.

Data Modeling & Design
- Data Association – Entities , Attributes & Association, Relationship among Entities, Representation of Association & Relationships
- Data Model: Importance of Data Model, Types of Data Model: Relational, E-R, Semi-structured, Object-Oriented, Network & Hierarchical Data Model. Advantageous & Disadvantageous of above model.

2   Unit – II: Entity-Relationship Data Model
- Entity , Entity Set, Types of Entities, Strong & Weak Entity, Representation
- Attribute, Types of Attributes , Representation
- Relationship : Binary & Ternary , Representation
- Mapping Cardinality, Entity-Relationship Design Issues

Relational Data Model
- Basic Structure of Relational Data Model, Database Schema
- Constraints : Integrity Rule 1 & 2
- Normal Form: Anomalies, Functional Dependency, Dependency Diagram, First Normal Form, Second Normal Form, Third Normal Form, Conversion from Universal to 1 NF, 1NF to 2 NF and 2NF to 3NF.

3   Unit – III:Relational Algebra
- Basic Operation – Union , Intersection, Difference and Cartesian Product
- Advance Operation- Projection, Selection, Join (Inner and Outer) & Division
- Examples based on above Operation.
- Relation Algebraic Queries.

Introduction to Oracle
- Oracle Software : Versions of Oracles, Products of Oracle, Tools of Oracle
- SQL: Logging to SQL/ iSQL, SQL plus worksheet.

Books:

1) Database System Concepts (Sixth Edition) AviSilberschatz, Henry F. Korth,S. Sudarshan
2) An Introduction to Database Systems byBipin C. Desai

3) Easy Oracle SQL: Get Started Fast Writing SQL Reports with SQL*Plus By John Garmany

4) Mastering Oracle SQL By Sanjay Mishra, Alan Beaulieu

Course: B.C.A.(Sci.)   **Semester : III**

Topic: Basic Mobile Repairing-I   **Paper No.: CA302-T**

1   Unit – I

Basic Electronic and Microcomponents

Introduction and Determining values of SMD (Surface Mounted) components: Resistors, Condenser, Semiconductor Diodes, PNP and NPN Transistors, N-Channel and P-Channel mosfets, Connectors, Coils, Fuse.

2   Unit-II

Fundamentals of Mobile Phone

Assembly and Disassembly of Different Mobile Phones, Testing of Batteries and Battery Chargers, Rework Station, Solder Iron, External Charger and Multi-Tester.

Human Interface Devices

Keyboard, Touchpad, Trackball, Block Diagram & Schematic Diagram of Different Mobile Phones, Replacing LCD Displays and FPC Belts of Mobile Phone, Identification of Chips and Crystals on the Mobile PCB Board, Track Tracing and Jumpering.

3   Unit-III

Introduction to Motherboard

Power section, Charging Section, Audio Section, Network Section, Display Section, Light Section, Keyboard Section, Replacing of Faulty Chips using Rework Station.

Introduction to Software for Mobile Repairing

Introduction to Flasher Software, Selection and Installation of EPROM Files, Unlocking of Phone Codes, Formatting of Internal Memory

Reference:

1. Modern Mobile Phone Repairing Using Computer S/W & Service Devices by ManaharLotia. BPB Publication.

   Link:http://www.saffroninstitute.com/mobile.html

Course: B.C.A.(Sci.)   **Semester : III**

Topic: Principle of Management   **Paper No.: CA303-T**

1   Unit – I

Introduction:

Management administration, organization concepts, definition, scope and importance of management. Evaluation of management, early contribution and modern management thought and pattern.

Principles of Management:

Division of work authority & responsibility, discipline – unity of command and direction, centralization remuneration. Scar, chain order equity, initiative

2   Unit-II

Function of management

Planning:

nature and purpose, objectives – planning premise,forecasting decision making, policy formulation and planning in action

Organizing:

forms and complexities or organization in business, trading forms and modern forms. University of organization, nature and purpose of organization, organization charts – span of management, departmentationline, staff relationships, functional aspects, delegation and decentralization of authority making the organization work role of committee.

Staffing:

The managerial job selection of managers, appraisal of management, personnel, development and training of managers, developing the executive tomorrow

3   Unit-III

Direction:

Nature of direction, motivation – Human factors in business administration, organization as a special behaviours, participation in management, communication leadership in administration, dimensions leadership role –leader –follower relationship

Controlling

Control process devices of control, overall control of performance ration analysis- management audit,control, quality control- advance control techniques,PERT, CPM etc.

Coordination:

Need, principles and techniques

Reference Books

1. Principles of Management – T. Ramaswami, Himalaya Publication
2. Principles of Management – T.N. Chhabra – DhanpatRai& Co. Pvt. Ltd.
3. Principles of Management – L.M. Prasad – Sultan Chand & Sons, Delhi

1   Unit – I:Introduction of OOPs

Procedural Vs Object Oriented Programming, Basic concepts of Object Oriented Programming, Class, Object, Data Abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing. Benefits and applications of OOP, History and overview of C++, C++ program structure. Reference variables, Scope resolution operator, Member de-referencing operators, new and delete, cin and cout, The endl and setw manipulator.

Functions in C++:

Function prototype, Call by reference (using reference variable), Return by reference, Inline function, Default arguments, Const arguments.

2   Unit – II: Function overloading:

Different numbers and different kinds of arguments,

Objects and Classes:

Specifying a class, private and public, Defining member functions, Nesting of member function, Object as data types, Memory allocation for objects, static data members and member functions. Array of objects, Objects as function argument, returning objects, Friend function and its characteristics.

3   Unit – III:Constructors and Destructors:

Introduction, default and parameterized constructors, Multiple constructors in a class, Copy Constructor, Destructors

Operator Overloading:

Overloading unary operators, Rules for operator overloading, Overloading without friend function and using friend function, Overloading binary operators such as arithmetic and relational operators, Concatenating Strings, Comparison operators.

Reference Books:

1. Object Oriented Programming with C++ E. Balagurusamy, Tata McGraw-Hill Publishing
2. Object Oriented Programming In C + + Robert Lafore, Galgotia
3. Let us C++ YeshwantKanetkar; bpb publication

1   Unit-I

Introduction

Definition &Basics of Personality, Determinants of Personality- biological, psychological and socio- cultural factors., Need for personality development

Self-Awareness and Self Motivation

Self analysis through SWOT and Johari window, Elements of motivation Techniques and strategies for self motivation, Motivation checklist and Goal setting based on principle of SMART, Self motivation and life, Importance of self-esteem and enhancement of self-esteem

2   Unit-II

Power of positive thinking:

Nurturing creativity, decision-making and problem solving, Traits of positive thinkers and high achievers, Goals and techniques for positive thinking Enhancement of concentration through positive thinking, Practicing a positive life style.

Public Speaking Skills:

Importance of public speaking, Voice Modulation, Audience Analysis Speaking with confidence, Body Language

3   Unit-III

Interpersonal Skills:

Concept of team in work situation, promotion of team spirit, characteristics of team player.,Awareness of one's own leadership style and performance. Nurturing leadership qualities., Emotional intelligence and leadership effectiveness- self awareness, self management, self motivation, empathy and social skills, Negotiation skills- preparation and planning, definition of ground rules, clarification and justification, bargaining and problem solving, closure and implementation

Etiquette; Telephone and Mail

      Telephone Etiquette; The usage of proper language, content, tone etc.

      Email Etiquettes: right usage of grammar, right style layout and other policies

PRACTICAL TRAINING

The course would include the following practical exercises:.

1. *1.* Ice- breaking. Brainstorming and simulation exercises.
2. *2.* Thought stopping. Memory and study skills training
3. *3.* Role- play, Social skills workshop
4. *4.* Transactional Analysis

REFERENCES

1. Mile, D.J (2004). Power of positive thinking. Delhi: Rohan Book Company.
2. Pravesh Kumar (2005). All about self- Motivation. New Delhi: Goodwill Publishing House.
3. Dudley, G.A. (2004). Double your learning power. Delhi: Konark Press. Thomas Publishing Group Ltd.
4. Lorayne, H. (2004). How to develop a super power memory. Delhi: Konark Press. Thomas Publishing Group Ltd.
5. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata McGraw Hill.
6. Swaminathan. V.D &Kaliappan. K.V(2001). Psychology for Effective Living. Chennai.The Madras Psychology Society.
7. Robbins, S.B.(2005). Organizational Behavior. New Delhi: Prentice Hall of India.
8. Smith, B (2004). Body Language. Delhi: Rohan Book Company.
9. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata Mcgraw Hill.

1   Introduction and basic concepts of Statistics
- Definition of Statistics, Scope and importance of Statistics.
- Primary and Secondary data, Types of data : qualitative, quantitative,
- discrete, continuous, cross-section, time series, failure, industrial, directional data.
- Graphical presentation: Histogram, frequency polygon, frequency
- Curves Diagrammatic presentation: Bar diagrams, Pie diagram, scatter diagram.
- Classification of data: Discrete and continuous frequency
- distributions, inclusive and exclusive methods of classification,
- relative and cumulative frequency distributions.

2   Measures of Central Tendency
- Concept of central tendency. For group and Ungroup data
- Arithmetic mean (A.M.) simple and weighted Merits and demerits of
- A.M.,Mode: Computation for frequency and non-frequency data.
- Computation of mode, Merits and demerits of mode. Median:
- Computation for frequency and non-frequency data, computation.Merits& demerits of median.
- Geometric mean (G.M.) computation for G M ,Merits demerits and
- applications of G.M.Harmonic Mean (H M) computation for
- frequency, non-frequency data, merits, demerits.

3   Measures of Dispersions
- Dispersion and measures of Dispersion ,
- Range (definitions and problems) Quartile Deviation (definitions and problems) Mean Deviation (definitions and problems) Standard Deviation (definitions and problems) Variance, different formulae for calculating Variance.

Books:

1. Fundamental of Mathematical Statistics By S.C.Gupta and V.K. Kapoor

Course: B.C.A.(Sci.)   **Semester : III**

Topic: Practical Based on C++   **Paper No.: CA307P (A)**

Minimum 10 Practicals to be performed as per the guidelines of teaching Faculty depending upon all theory units of concerned subject.

Course: B.C.A.(Sci.)   **Semester : III**

Topic: Practical Based onDatabase Management System   **Paper No.: CA307P(B)**

1) Design five schemas for any organization like: College, school, hospital, travel agency, company, bank etc.
2) Normalize the above five selected schemas as per 1NF,2NF and 3NF
3) Draw E-R Diagram for the same.
4) Solve atleast ten Relational Algebraic Queries

Course: B.C.A.(Sci.)   **Semester : III**

Topic: Practical Based on Mobile Repairing-I   **Paper No.: CA308P(A)**

Minimum 10 Practicals to be performed as per the guidelines of teaching Faculty depending upon all theory units of concerned subject.

Course: B.C.A.(Sci.)   **Semester : III**

Topic: Practical based on Statistical Method   **Paper No.: CA308P(B)**

Minimum 10 Practicals to be performed as per the guidelines of teaching Faculty depending upon all theory units of concerned subject.
The Practical is to be conducted in the Excel / Spread-Sheet.

B.C.A.(Science)

Semester –IV

1   Unit – I: Structured Query Language

- DDL Statements to Create and Manage Tables using Create & Alter
- Manipulating Data using Insert, Update & Delete Statement
- Retrieving Data Using SQL Select, Restricting and Sorting Data, Using Single-Row functions, Conversion Functions and Conditional Expressions
- Aggregated Data Using Group Function, Displaying data from Multiple tables, Sub queries, Set Operators

2   Unit – II:Data Storage

- Overview of Physical Storage Media
- Magnetic Disk
- RAID
- Tertiary Storage
- Storage Access

Database System Architecture

- Centralized and Client-Server Architecture
- Server System Architecture
- Parallel System

3   Unit – III:Transaction Processing

- Transaction Concept
- Transaction State
- Implementation of Atomicity and durability
- Concurrent Execution

Concurrency Control Techniques

- Lock-Based Protocol
- Timestamp-Based Protocol
- Deadlock Handling

Books:

1) Database System Concepts (Sixth Edition) AviSilberschatz, Henry F. Korth,S. Sudarshan
2) An Introduction to Database Systems byBipin C. Desai
3) Easy Oracle SQL: Get Started Fast Writing SQL Reports with SQL*Plus By John Garmany
4) Mastering Oracle SQL By Sanjay Mishra, Alan Beaulieu

Course: B.C.A.(Sci.)   **Semester : IV**

Topic: Advance Mobile Repairing   **Paper No.: CA402-T**

1   Unit – I

Knowledge of Mobile Phone Technology

Introduction to Mobile Phone Technology, Types of Technology, Working Principle of Mobile, Features of Mobile Phone.

Microchip & Microprocessor Technology

Introduction of Microchip & Microprocessor, Identification of Different Types of Microchip & Microprocessor, Processor in Different types of Mobile Phones, Soldering & D-Soldering of Microchip and Microprocessor

2   Unit-II

Chip Level Practical Training

Use of Micro Iron, SMD Machine and Hotgun, Chip Component Removing & Replacing, Jumper Connectivity (Antenna Switch Jumper, Track Break Jumper, Drive IC Jumper), Jack Changing (SIM Jack, Charging Jack, Hand Free Jack, Battery Connection).

Circuit Diagram of Mobile and Complete Software Installation

Circuit Diagram of Charging Section, CPU Section. Logo Manager, Ringtones, Wallpaper, Songs, Games and Picture Installation in Mobile. Flashing by USF, DCT. Installation of Application Program. Locking and Unlocking. Card Reader, Bluetooth, DKU.

3   Unit-III

Tracing & Fault Finding in Hardware & Software

Track Reading, Track Checking using Multi meter, Cool Testing in Mobile, Hot Testing in Mobile. Fault Finding using Software (SIM Locked, SIM Rejected, Hanging Problem, Restart Problem). Fault Finding using Hardware (Dead, Network Problem, SIM Card Rejected, Mic/Speaker not Working, No Charging, No Vibration).

Reference:

1. Advance Mobile Repairing: (Multicolour Circuits, Service Diagrams & Repairing)byManaharLotia. BPB Publication.

   Link:http://www.slideshare.net/jyotichhabra/mobile-repairing-course-details2

1   Unit – I
Introduction to Software Project Management:

Software project versus other types of project. Problems, Requirement specifications. Introduction to step wise project planning Select identify scope and objectives - identify project infrastructure -

Analyse project characteristics - products and activities.

2   Unit - II

Project evaluation

Introduction to Strategic assessment – technical assessment - cost benefit analysis - cash flow forecasting – cost benefit evaluation techniques - risk evaluation.

3   Unit – III

Selection of an appropriate project approach –

Choosingtechnologies - technical plan contents list - choice of process models - structured methods - rapid application development -waterfall model - spiral model - software prototyping - ways ofcategorizing prototypes - tools - incremental delivery.

Books for Study:

1. Software project management : Bob Hughes and Mike Cotterell - - Fourth edition - McGraw Hill

2. Software Project Management : Walker Royce - - Addison Wesley.

1   Unit-I: Object oriented paradigm

Basic concepts of Object oriented programming: class & object, data abstraction and encapsulation, inheritance, polymorphism, dynamic binding, message communication. Benefits and applications of OOP. History and features of Java. Java Vs. C++. Java and Internet, Java and www. Java environment. Structure of java program, symbolic constants. Data types.

Arrays, Classes and Objects

Declaration and initialization, one and multidimensional arrays Defining a class, adding variables and methods, creating objects, static fields and static methods. Method overloading, Constructors: types and multiple constructors in class. Command line arguments.

2   Unit-II: Inheritance

Super and sub class, defining a subclass. Single inheritance, multilevel inheritance and hierarchical inheritance. Subclass constructors. Super keyword, Visibility controls, Method overriding, Dynamic method dispatch, Abstract methods and class.

Interfaces, String and Vector Class

Defining interfaces, implementing interfaces, extending interfaces, accessing interface variables. String class and its methods, Vectors

3   Unit-III: Packages

Introduction, Java API packages, Naming conventions, creating and accessing user defined package, using a package, adding a class to a package, importing classes from package.

Exception handling and Multithreading

Exceptions, syntax of exception handling code, multiple catch statements, throw: throwing own exceptions, throws and finally Introduction to multithreading, creating threads by extending the Thread class and by implementing Runnable interface, implementing the run() method, Life cycle of a thread, Thread methods and thread priority.

Books:

1. Prgramming with JAVA: E. Balagurusamy, Tata Mc-Graw Publishing Company Ltd.

2. The Complete Reference J2SE: Herbert Schildt, Tata Mc-GrawPub. Comp.Ltd.

3. Core Java-2 Vol-I &Vol-II - Cray S. Horstmann, Gray Corneel; Pearson Education, Low Price edition

Course: B.C.A.(Sci.)   **Semester : IV**

Topic: Aptitude and Logical Reasoning   **Paper No.: CA405-T**

===

1   Unit –I
Arithmetical Ability- I
Numbers- types of numbers, face value and place value, operations on numbers, decimal fractions, problem on numbers, average, square roots and cube roots, problems on numbers, percentage, area, surds and indices, profit and loss, True discounts, Banker's Discounts

2   Unit - II
Arithmetical Ability- II
Ratio and Proportion, Partnership, Time and Work, Time and Distance, Problems on trains, simple interest, compound interest, logarithms, volume and surface areas, Permutations and Combinations, Probability, Odd man Out and series

3   Unit – III
Data Interpretation
Tabulation, Bar graphs, Pie Charts, Line Graphs

Logical Reasoning -Clocks, calendars, binary logic, seating arrangement, blood relations, logical sequence, assumption, premise, conclusion, linear and matrix arrangement

Reference Books:

1) Quantitative Aptitude- R S Agrawal
2) Quantitative Aptitude for Competitive Examiners- By AbhijitGuhal
3) A Modern Approach to Verbal Reasoning - By R S Agrawal
4) Logical and analytical reasoning - By R Gupta
5) Quantitative Aptitude - By S N Jha

Unit –I

Introduction to LPP, some important definitions, Formulation of LPP, Graphical Method, General formulation of LPP, Slack and Surplus Variables, Standers form, matrix form of LPP. Problems on Graphical Method

Unit –II

Simplex Method : Computational procedure of Simplex Method, Computation by Simplex Method, artificial variable method. Problems on Simplex method.

Unit –III

Duality in Linear Programming: Introduction, Definition of Primal   Dual Problem, converting Primal into its Dual, Duality and Simplex Method, Problems.

Unit –IV

Assignment Problem: formulation of Assignment Problem, Hungarian Method for assignment problem

Unit –V

Transportation Problem: formulation of Transportation Problem, Matrix form of Transportation Problem, Feasible Solution, Basic Feasible solution, and Optimal Solution, problems.

Books:

1. Operation Research by S.D. Sharma

2. Introduction to Operations Research by Frederick S.Hiller, Gerald J.Lieberman

3. Operations Research An introduction by Hamdy A. Taha,

4. Operations Research by Kantiswarup, Gupta P.K. and ManMohan. "Operating System",

   By Stuart E.Madnick, John J.Donovan.

5.

Course: B.C.A.(Sci.)	**Semester : IV**
Topic: Practical Based on Java Programming	**Paper No.: CA407P (A)**

Minimum 10 Practicals to be performed as per the guidelines of teaching Faculty depending upon all theory units of concerned subject.

Course: B.C.A.(Sci.)	**Semester : IV**
Topic: Practical Based on Adv. DBMS	**Paper No.: CA407P (B)**

1) Using SQL commands to create the tables and views of five schemas for any organization like: College, school, hospital, travel agency, company, bank etc.
2) Perform Data Definition Language Commands
3) Perform Data Manipulation Language Commands
4) Perform Minimum 10 Queries on each of the above five schemas.

Course: B.C.A.(Sci.)	**Semester : IV**
Topic: Practical Based on Mobile Repairing	**Paper No.: CA408P(A)**

Minimum 10 Practicals to be performed as per the guidelines of teaching Faculty depending upon all theory units of concerned subject.

Course: B.C.A.(Sci.)	**Semester : IV**
Topic: Mini Project Using Web Technology	**Paper No.: CA408P(B)**

Note:A mini project having minimum 5 forms, using Web Technology as a front end and any DBMS as backend. Team size maximum 2 students.

Minimum contents of Project Report
1. Introduction
2. Problem definition.
3. System Requirement Specification
   3.1. User Interview
   3.2. Current System flow diagram
   3.3. Proposed System.
4. E-R Diagram
5. DFD
6. Sample Screens

7.   Conclusion