SOLAPUR UNIVERSITY, SOLAPUR

BACHELOR OF COMPUTER APPLICATIONS

(B.C.A. II Sem-III and IV)

CGPA Syllabus- June 2015

BCA Semester-III Subjects

Paper Name: Data Structure using 'C'

Paper Code: 301

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Networking and Data communication

Paper Code: 302

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Database Management System

Paper Code: 303

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Core Java

Paper Code: 304

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Financial Management

Paper Code: 305

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Lab Course -3

Practical Paper-I based on Paper Code 301

Practical Paper-II based on Paper Code 304

Paper Code:306

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Practical	4	4	Practical		100	UA	--	--	Marks System
						CA	40	100	Marks System

BCA Semester-IV Subjects

Paper Name: Software Engineering

Paper Code: 401

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: RDBMS with Oracle

Paper Code: 402

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Operating System

Paper Code: 403

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Web technology-II

Paper Code: 404

TLM	Hrs	Credit	AM	Min	Max	AT	Min	Max	Evaluation System
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: E-Commerce Paper Code: 405									
TLM	**Hrs**	**Credit**	**AM**	**Min**	**Max**	**AT**	**Min**	**Max**	**Evaluation System**
Lecture	4	4	Theory		100	UA	28	70	Marks System
						CA	12	30	Marks System

Paper Name: Lab. Course-4 Practical Paper- I based on: Paper Code 402 Practical Paper-II based on : Paper Code 404 Paper code:406									
TLM	**Hrs**	**Credit**	**AM**	**Min**	**Max**	**AT**	**Min**	**Max**	**Evaluation System**
Practical	4	4	Practical		100	UA	--	--	Marks System
						CA	40	100	Marks System

Abbreviations: TLM – Teaching Learning Method; AM – Assessment Method; AT: Assessment Type; UA – UniversityAssessment; CA – College Assessment; Hrs- Contact Hours per Week; Min – Minimum Marks; Max – Maximum Marks

A Student who failed in University Examination (Theory) & Passed in internal assessment of a same paper (subject) shall be given FC Grade Such student will have to appear for University Examination only.

A Student who fails in Internal Assessment and passed in University examination

(Theory) shall be given FR Grade. Such student will have to appear for both University

Examination as well as internal assessment.

Passing Criteria:

- **The candidate will be allowed to carry all students for next semester.**
- **However while going to fifth semester a candidate should clear all subject of first year.**

Credit System Structure for B.C.A- II Semester III

Paper Code	Name Of Subject	Hrs/Week			Paper Marks	UA	CA	Credits	Total
		L	T	P					
301	Data Structure using 'C'	4	-	-	100	70	30	4	
302	Networking and Data communication	4	-	-	100	70	30	4	
303	Database Management System	4	-	-	100	70	30	4	
304	Core Java	4	-	-	100	70	30	4	
305	Financial Management	4	-	-	100	70	30	4	
306	Lab Course -3 Practical Paper-I based on Paper Code 301 Practical Paper-II based on Paper Code 304	-	-	4	100	-	100	4	
	Total	20	-	4	600			24	24 credits

Credit System Structure for B.C.A- II Semester IV

Paper Code	Name Of Subject	Hrs/Week			Paper Marks	UA	CA	Credits	Total
		L	T	P					
401	Software Engineering	4	-	-	100	70	30	4	
402	RDBMS with Oracle	4	-	-	100	70	30	4	
403	Operating System	4	-	-	100	70	30	4	
404	Web technology-II	4	-	-	100	70	30	4	
405	E-commerce	4	-	-	100	70	30	4	
406	Lab. Course-4 Practical Paper- I based on: Paper Code 402 Practical Paper-II based on : Paper Code 404	-	-	4	100	-	100	4	
Total		20	-	4	600			24	24 credits
BCA-II									
Sem-III					600			24	24
Sem-IV					600			24	24
Total					1200			48	48 credits

Abbreviations: L: lectures, T: Tutorials, P: Practical; UA: University Assessment by End

Semester Examination; CA: College assessment by Internal Continuous Examination; UA(University Assessment): University Theory paper shall be of 70 marks for 3.00 hrs duration; CA(College Assessment): The internal examination for Theory and Practical course.

Internal Evaluation

The internal evaluation will be of 30 marks which will consists of following heads. The internalevaluation should be done accordingly and marks should be send to university.

Internal	Marks
Attendance	05 Marks
2 Class & 2 Home Assignments	10 Marks
Seminar/ Group Exercise	10 Marks
Mid Test	05 Marks
Total	**30 Marks**

8. Standard of Passing:

The student has to secure a minimum of 4.0 grade points (Grade C) in each paper. A student who secures less than 4.0 grade point (39% or less marks, Grade FC/FR) will bedeclared fail in that paper (subject) and shall be required to reappear for respective paper.

A student who failed in University Examination (Theory) & passed in internal assessment of a same paper (subject) shall be given FC Grade. Such student will have toappear for University Examination only.

A student who fails in Internal Assessment and passed in University examination (Theory) shall be given FR Grade. Such student will have to appear for both University examination as well as internal assessment.

Passing Criteria:

- The candidate will be allowed to carry all subjects for next semester.
- However while going to fifth semester a candidate should clear all subjects of first year.

SOLAPUR UNIVERSITY, SOLAPUR.

Revised Syllabus and Structure of the

Bachelor of Computer Applications (BCA)

1. Title :

The degree shall be titled as Bachelor of Computer Applications (BCA)

2. Objectives of the course:

This is a three years bachelor degree course in computer applications aimed at developing computer professional versatile in use of computers mostly in business world. The emphasis is to have generality of developing professionals as programmer, system analysts, database administrators, documentation officer etc.

3. Duration:

i) The course shall be a full time course.

ii) The duration of course shall be three years.

iii) The course shall be run on self-supporting basis.

4. Number of Students:

A batch shall consist of not more than 60 students.

5. Eligibility:

i) A candidate for being eligible for admission to the Degree Course in Computer. Candidate shall have passed XII std. Examination of the Maharashtra Board of Higher Secondary Education or its equivalent or any Diploma of not less than two years.

ii) A candidate has to appear for a common entrance test to be conducted by respective college for getting admission to this course.

1 Percentage at HSC – 100

2. Percentage at entrance – 100

200

The merit list will be prepared on the basis of percentage of HSC and percentage at entrance examination. Students will be admitted on the basis of Merit list.

6. Medium: The medium of instruction and examination will be only English.

a) Details of Internal examination

Attendance - 5 Marks

Assignment – 10 Marks (2 home and 2 Class assignments)

Mid-test - 5 Marks

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20 Marks

b) Marks of Lab course and mini project will be given by the concerned college. On the basis of evaluation by the internal teacher.

c) Original Report and Viva-Voce:

Project Report will be assessed by the internal teacher at the end of sixth semester out of 70 marks and there will be viva-voce examination of 80 marks. The panel of examiners will consist of one internal and one external appointed by university.

Standard of Passing:

A candidate must obtain minimum 40% marks for passing in each university examination paper, internal examination, Lab course, Mini and Major Project.

i) Class will be awarded on the basis of marks obtained by the candidate in all the six semester examination.

ii) Candidate who has secure 40% marks in each head of internal credit and semester examination shall be declared to have passed in the paper.

iii) A candidate who fails in any particular theory papers shall be allowed to reappear for that theory paper. However, his/her internal credit marks shall be carrying forwarded.

Award of Class:

Class should be awarded to the students of BCA on the basis of aggregate marks in the six semesters.

The award of class shall be as under:

Aggregate 70% and above	First class with distinction,
Aggregate 60% and above	First Class But less than 70%,
Aggregate 50% and above	Second Class But less than 60%
Aggregate 40% and above	Pass Class But less than 50%

BCA- II (SEMESTER-III)

Paper Code: BCA301

Data Structure Using 'C'

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to Data structure and Array [4]

1. Concept of Abstract Data Types
2. Definitions – Data types, Data objects, Data Structure.
3. Array

Unit 2: Stack [6]

1. Definition of stack.
2. Operations on stack
3. Representation of Stack
4. Applications of stack – Inter conversion between infix, prefix and Postfix expression, Expression validity, Evaluation of Postfix expression, Stack in Recursion.

Unit 3: Queue [6]

1. Definition of queue
2. Operations on queue
3. Types of queue –Linear queue, Circular queue, Priority queue, Deque
4. Implementation of Linear queue, Circular queue, Priority queue, Deque
5. Applications of queue
6. Comparison between Stack and Queue.

Unit 4: Linked List [8]

1. Drawbacks of sequential storage
2. Concept of Linked List
3. Types of Linked list.
4. Operations on Linked List
5. Implementation of linked List
6. Implementation of Stack and queue using linked list

Unit 5: Tree [8]

1. Tree terminology
2. Representation of Binary Trees
3. Operations on binary trees
4. Types of Binary tree- Strictly, Complete, Extended, Threaded, Binary Search tree, Expression tree.
5. Tree Traversal Methods– (Preorder, In order, Post order)
6. AVL tree

Unit 6: Sorting and Searching [8]

1. Introduction
2. Efficiency consideration
3. Sorting Methods:
    - Exchange Sort
    - Bubble Sort
    - Insertion Sort
    - Selection sort
    - Merge and radix sort
    - Quick sort
4. Linear Search: For Sorted and Unsorted Data
5. Binary Search.
6. Indexed sequential search

Reference Books:

1. Data structure using ‘C’ by Tannenbaum
2. Data Structure Thorough ‘C’ by G.S. Baluja.
3. Fundamentals of Data Structures ---- By Horowitz Sahani (Galgotia)
4. Introduction to Data Structures using C---By Ashok Kamthane
5. Data Structures using C --- Bandopadhyay & Dey (Pearson)

Paper Code: BCA302

Networking and Data communication

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to Data Communication & Networking [6]

Data Communication: Components, Data Representation, Data Flow, Communication Model, Computer Network: Introduction of Network, Uses of a computer network, Network Criteria, Network Topologies, Types of Networks, Inter-networking

Internet: History of Internet, Applications of Internet

Network Components: Hubs, Switches, Repeaters, Bridges, Routers, Gateways

Unit 2: Network Models [6]

Protocols & Standards, Protocol Hierarchies, Design Issues of Layers,

Services Primitives, Connection oriented and connection less services

Reference Model: ISO-OSI reference model

Unit 3: Physical layer [12]

Signals: Analog & Digital Signals, Period, Frequency, Phase, Amplitude,

Bandwidth, Bit Rate, Bit Length, Fourier analysis

Transmission Media:

- Guided Media: Magnetic Media, Twisted Pair, Coaxial Cable, Fiber Optic Cable
- Unguided Media: Wireless- Radio Waves, Microwaves, Infrared, Satellite Communication

Analog Transmission: Modem, Telephone System

Modulation: Amplitude Modulation, Frequency Modulation, Phase Modulation

Transmission Mode: Parallel, Serial, Synchronous Transmission, Asynchronous Transmission

Multiplexing & Switching:

Multiplexing: Frequency Division Multiplexing, Time Division Multiplexing, Wavelength Division Multiplexing

Switching: Circuit Switching, Message Switching, Packet Switching

Unit 4: Data link layer [10]

Data link layer Design issues.

Error Detection & Correction: Types of Errors, Hamming Distance, Error

Detection: Parity Check, Cyclic Redundancy Check, Checksum Check

Error correction, Data Link Control: Framing, Flow & Error Control,

Protocols: Simplex, Stop and Wait, Stop and Wait ARQ, Selective repeat ARQ

Multiple Access Protocol: ALOHA, CSMA, CSMA/CD, CSMA/CA Channelization, FDMA, TDMA, CDMA

Unit 5: Network layer [8]

Network layer Design issues, Routing Algorithm: Optimality Principle, Shortest Path Routing, Distance Vector Routing, Link State Routing, Broadcast Routing, Multicast Routing

Congestion Control Algorithm: General principle of congestion control, Congestion prevention policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets

Unit 6: Transport, Session, Presentation & Application layers [10]

- Elements of Transport Protocols, Addressing, Connection establishment, Connection Release, Flow Control & Buffering, TCP/IP protocol suite, Transmission Control Protocol, User Datagram Protocol, IP, Real Time Transport Protocol , FTP, DNS, Telnet, SMTP, POP, HTTP, WWW, ARP, RARP
- Data Compression
- Audio Compression
- Video Compression

Reference Books:

1. Computer Networking. by Tannenbaum.
2. Data communication and networking by William Stallings
3. Data communication and networking by B A Forouzan
4. Data communication and networking by Achyut Godbole
5. Data communication and networking by Jain

Paper Code: BCA303

Database Management System

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to database system [6]

- Definition, Limitations of traditional file system.
- Advantages of DBMS
- Components of DBMS
- Database Architecture
- Database Users

Unit 2: Data Models [8]

- Schemas and instances
- 2 tier and 3 tier architecture
- Database languages
- Types of data models:
    - Network
    - Hierarchical
    - E-R model: E-R Diagram, entities, attributes and its types, Relationship and relationship sets, Cardinality, Degree, Generalization, Specialization, Aggregation

Unit 3: Relational Model and Database design [8]

Relation, Domain, Tuples, types of keys, relational integrity rules, Codd's rules, Relational Algebra operations:- Select, Project, Cartesian Product, Union, Set difference, Natural Join, Outer Join, dependencies and its types, Normalization and its forms, lossless joins

Unit 4: Data Storage and File Organization [8]

- Storage Devices
- File organization
- Operations on File, Primary Key Retrieval
- Indexing and method of indexing

Unit 5: Transaction Management [6]

Introduction, properties (ACID), transaction states, scheduling, conflict and view Serializability, three problems of concurrency control.

Unit 6: Concurrency Control [10]

Introduction, log based protocols, timestamp based protocol, deadlock, deadlock handling, failure classification.

Unit 7: Database recovery and Atomicity [12]

Introduction, recovery algorithms, log base recovery, shadow paging, recovery with concurrent transaction, checkpoints/sync points/save points.

Reference Books:

1) Database System Concepts by Korth Silberschetz
2) Fundamentals of Database Systems by Elmsari, Navathe
3) Teach Yourself SQL in 14 Days by Jeff Parkins and Bryan Morgan
4) Client Server Computing for Dummies
5) An Introduction to Database Systems by Bipin Desai

Paper Code: BCA304

Core Java

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to Java Programming [6]

- Overview of Java
- Features of Java as programming language /Platform
- JDK Environment and Tools

Unit 2: Java Programming Fundaments [6]

- Data types, Variables, Operators, Keywords, Naming Conventions
- Structure of Java Program
- Flow Control- Decision, Iterations
- Arrays

Unit 3: Classes and Objects [10]

- Class – Members access control, Objects, Constructors, Use of 'this' keyword
- Static, non-static data members and methods.
- public, private & protected data members

Unit 4: Inheritance & Polymorphism [10]

- Access/Scope specifiers protected
- Super, extends, single, multiple inheritance
- Method overriding
- Abstract classes & ADT, 'final' keyword
- Extending interfaces

Unit 5: Exception Handling [6]

- Exceptions and Types, try.. catch
- finally block, throw & throws statement, user-defined exceptions

Unit 6: Threading [8]

- Java thread lifecycle
- Thread class & run able interface Thread priorities & synchronization
- Usage of wait & notify

Unit 7: Java I/O [6]

Java I/O package, byte & character stream, reader & writer, file reader & writer

Unit 8: Event Programming [10]

- Java awt components: window, Frame, Panel, Dialog, File Dialog, Label, Button, List, Check Box, Text Components, Choice, MenuComponents
- Layout Managers
- Border, Flow, Grid, Event Model
- Listeners / Adapters

Reference Books:

1. Java 2 for professional developers by Michael Morgen
2. Core Java Vol 1 and vol 2 by Cay. S. Horstmann, Gray Cornell.
3. Java by Nutshell
4. Java The complete Reference by Herbert Schildt
5. Thinking in java by Brucel

Paper Code: BCA305

Financial Management

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: INTRODUCTION TO FINANCIAL MANAGEMENT [12]

Introduction : Meaning & Definition of Finance / Business Finance & types of Finance Financial Management Meaning Significance, & Definition / Importance of Financial Management & Financial planning / Functions of Financial manager Profit maximization Favorable /Unfavorable points of profit maximization-Merits & demerits of profit maximization Wealth maximization

Unit 2: Financial Planning [12]

Meaning, Objectives, Characteristics, Steps, and Types of financial plans, Capitalization: Concept, Theories of capitalization, over - capitalization and under - capitalization.

Unit 3: Management of Working Capital [12]

Meaning and Concept, Importance of adequate working capital, Types of working capital, Determinants of working capital, Types of Working Capital / Working Capital and Banking Committee Computation of working capital (Practical Problems)

Unit 4: Operating and Financial Leverage [12]

Introduction: Meaning of leverage, Definition of leverage, Types of leverage Operating Leverage, Degree of operating leverage, Uses of operating leverage Financial Leverage, Degree of financial leverage, Alternative definition of financial leverage, Uses of financial leverage / Distinguish Between Operating Leverage and Financial Leverage, Degree of combined leverage &Working Capital Leverage

Reference Books:

1. Financial Management : C.Parmasivan & T Subramanian Periyar University Salem
2. Financial Management : Text and Problems : M. Y. Khan and P. K. Jain
3. Financial Management : An Analytical and Conceptual Approach, S. C. Kuchal
4. Financial Management : I. M. Pandey
5. Taxman's Financial Management : Ravi M. Kishore
6. Financial Management : Principles and Practice : S. N. Maheshwari

Paper Code: BCA306

LAB COURSE-3

Practical Paper-I based on- Paper Code BCA301
Practical Paper-II based on- Paper Code BCA304

Max. Marks: 100

Internal Assessment: 100

Practical Paper-I based on Paper Code BCA301

1) Write a program to find maximum and minimum number between array
2) Write a program to insert element in an array at given position
3) Write a program to print array in reverse manner.
4) Write a menu driven program to find addition, subtraction and multiplication of two matrices.
5) Write a program to implement stack by using array.
6) Write a menu driven program for following operations:
    a. Conversion of infix to prefix
    b. Conversion of infix to postfix
    c. Evaluation of Postfix expression
    d. Check expression is valid or not
7) Write a program to implement different types of queue by using array.
8) Write a program to implement singly and doubly linked list with its basic operations
9) Write a program to stack and queue by using linked list.
10) Write a program to implement tree with different traversal techniques.
11) Write a menu driven program to implement different sorting techniques.
12) Write a menu driven program to implement different searching methods.

Practical Paper-II based on Paper Code BCA304

1) Write a program to find maximum and minimum number between array
2) Write a program to print array in reverse manner.
3) Write a menu driven program to find addition, subtraction and multiplication of two matrices.
4) Write a menu driven program to perform following operations:
    a. Check number is Armstrong or not.
    b. Check number is Palindrome or not.
    c. Check number is Perfect or not.
    d. Check number is Prime or not.
    e. Check number is Magic or not.
5) Write a program that uses 'super' keyword.
6) Write a program that uses 'this' keyword.
7) Write a menu driven program to implement different types of inheritances.
8) Write a program to implement method overloading.
9) Write a program to implement method overriding.
10) Write a program to handle different types of exceptions.
11) Write a program that uses user defined exceptions.
12) Write a menu driven program to read, write, append, and copy the file.
13) Write a program to use serialization concept in file.
14) Write a program that uses different awt components on a frame.
15) Write a program that uses different listeners.

BCA- II (SEMESTER-IV)

Paper Code: BCA401

Software Engineering

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: System concepts [8]

Definition, Elements of system, system concepts, Types of system, System Analysis, Role of System Analyst

Unit 2: Software Engineering [4]

Definition, Characteristics of software, Qualities of software

Unit 3: System Development life cycle [8]

System Development life cycle, classical model, Spiral model, Waterfall model, Prototyping

Unit 4: Requirement Analysis [8]

Requirement Anticipation, Requirement investigation, requirement specifications, feasibility study

Unit 5: Fact finding techniques [8]

Interviews, Questionnaire, Record reviews, Observation

Study of physical system, identifying the data used, identifying the controls

User transaction Requirements, User design requirements, Organization dependant requirements

Unit 6: Analysis and Design Tools [8]

• Flow charting, Decision tables & Decision Trees, Structure charting Techniques(HIPO)

Unit 7: System Design [8]

Entity relation Analysis, Normalization, Input output design, Data flow Diagram (Physical, Logical), structured chart, Structured English

Data Dictionary: Advantages of data Flow Analysis, Features of Data Dictionary, Process

Specification Methods

Unit 8: Configuration and Construction of the System [6]

Collection of system statistics, Setting Sub-system Boundaries Fractional Approach, Incremental Approach

Unit 9: Software Testing, Implementation and maintenance [8]

Need of Testing, White Box, Black Box testing

Changeover, Pilot, Parallel

Unit 10: Case studies [8]

Pay Roll, Library System, Inventory Control, College Admission System

Reference Books:

1) Analysis and Design of Information Systems by James Senn.

2) System analysis and design by Elias Awad

3) Software Engineering by Pressman

4) System Analysis and Design by Parthsarty / Khalkar

5) Practical guide to structure System Design by Miller/Page/jones.

Paper Code: BCA402

RDBMS with Oracle

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to RDBMS [6]

Concepts of RDBMS, difference between DBMS and RDBMS, RDBMS terminology, Relation, Attribute, Domain, Tuple

Unit 2: SQL (Structured Query Language) [10]

Features of SQL, Data types, Integrity Constraints, Classification of SQL commands, DDL and DML commands, SQL operators and clauses, Logical, Relational, in, between, like operator, Order by, group by, having clause

SQL functions: Arithmetic functions, Conversion functions, Aggregate functions, Date Functions, String Functions

Views, indexes, sequence, synonyms, cluster

Unit 3: Sub queries and join [4]

Sub queries and nesting sub queries,

Join: Cartesian Join, Equi-Join, Self Join, outer join

Unit 4: PL-SQL [6]

Comparison between SQL and PL/SQL, Structure of PL/SQL

If-else construct, Loop statement for loop, while loop

Unit 5: Cursor [4]

Definition of cursor, Types of cursor-implicit, Explicit, Open, Fetch, Cursor Attributes, Close cursor, Parameterized cursor.

Unit 6: Procedure & function [12]

Definition of procedure & functions, IN, OUT AND INOUT Parameters, Triggers, Packages, Exception handling

Reference books:

1. Database System Concepts-Korth, Silberschetz, Sudarshan.
2. Oracle, The Complete Reference- Oracle Press.
3. SQL & PL/SQL-Ivan Bayross

Paper Code: BCA403

Operating System

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to Operating System [4]

Definition of Operating System, Types of O.S. (Batch, Parallel, Multiprogramming, Time Sharing, Distributed, Real time)

Unit 2: Structure of O.S. [6]

System Components, Services provided by O.S., Monolithic and Layered Systems, System design and implementation, System Generalization and virtual machine

Unit 3: Process Management, Scheduling and Synchronization [12]

Concepts-Process, System calls, Operations on Process, Co-operating Process and threads, Inter process Communication

Basic Concept, Scheduling criteria, Scheduling Algorithms: FCFS, SJF, Round Robin, Priority Scheduling.

Critical section problem, Semaphores, Critical Regions, Classic Problems of Synchronization

Unit 4: Deadlocks [6]

Definition, Handling Deadlocks, Deadlock avoidance, Deadlock detection and Recovery.

Unit 5: Memory Management [8]

Background, Swapping, Continuous Memory Allocation, Paging, Segmentation, Virtual memory Demand Paging, Process criteria, Page replacement algorithm.

Unit 6: File System [4]

Directory structure, File Structure, File Naming, File Types, File Protection, Allocation of disk space, File operations and File Handling.

Reference Books:

1. System programming and O.S. By D.M. Dhamdhere.
2. Modern O.S. By Andrews Tanenbaum.
3. Operating System Concepts By Siberchatz and calvin.

Paper Code: BCA404

Web Technology-II

Max. Marks: 100
External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to PHP [5]

- History of PHP
- PHP is better than Its alternatives
- Interfaces to External systems
- Hardware and Software requirements
- Benefits of PHP as a server side languages
- How PHP works with the web server
- Installation and Configuration files
- PHP Framework

Unit 2: Basic PHP [5]

- Basic PHP syntax
- PHP data types
- Displaying type information
- Testing for specific data type
- Changing type with Set type
- Operators
- Variable manipulation
- Dynamic variables
- Static vs. Dynamic Optimization
- Redirecting web pages

Unit 3: Control Structures [6]

- If condition Statement
- The switch statement
- Using the ? operator
- While, do while and for Loop
- Breaking out of loops
- Nesting loops

Unit 4: String Manipulation & Regular Expressions [6]

- Formatting String for Presentation
- Formatting String for Storage
- Joining and Splitting String
- Comparing String
- Matching and replace Substring, patterns
- The basic regular expressions
- Matching patterns
- Finding matches

Unit 5: Functions [7]

- Function and its Types
- Library Function
  - Array functions
  - String functions
  - Date and time functions
  - Maths functions
  - Other important functions
- User-defined functions
- Creating a function
- Returning value from function
- Dynamic function calls
- Variable scope
- Accessing variable with the global statement
- Function calls with the static statement
- Setting default values for arguments
- Passing arguments to a function by value
- Passing arguments to a function by reference
- Using require() and include()

Unit 6: Arrays [5]

- Single-Dimensional Arrays
- Multidimensional Arrays
- Associative arrays
- Accessing arrays
- Getting the size of an array
- Examining arrays
- merging arrays
- Sorting arrays
- Sorting an associative arrays

Unit 7: File System [6]

- Creating and deleting a file
- Reading and writing text files
- Working with directories
- Checking for existence of file and directories
- Determining file size
- Opening a file for writing, reading, or appending

Unit 8: Object Oriented Programming in PHP [7]

- Object oriented concepts
- Define a class and objects
- Class attributes
- Object properties
- Object methods
- constructors and destructors
- Class constants
- Static method
- inheritance
- Abstract classes
- Exception Handling
- Final keyword
- Implementing Interface
- Object serialization
- Understanding Advance and New
- Checking for class and method existence
- Iterations

Unit 9: Working With Forms [7]

- Forms
- Forms controls properties, methods and events
- Retrieving form data with $_POST, $_GET and $_REQUEST arrays
- Validating retrieved data
- Strategies for handling invalid input
- Super global variables
- Super global array
- Importing user input
- Accessing user input
- Combine HTML and PHP code
- Using hidden fields
- Redirecting the user
- File upload and scripts
- Validation
    - Server side validation
    - Client side validation (Java script)

Unit 10: Working with Database MySQL [7]

- History of MySQL
- Installation and Upgradation to MYSQL
- MySQL Architecture
- Invoking MySQL through Command Line
- MySQL Server Start and Stop
- Overview of Data Types in MySQL

- Defining a Database
- Creating Tables and Fields in MySQL
- Working with PHP-MySQL Environment
- Connecting to the MYSQL
- Selecting a database
- Adding data to a table
- Displaying returned data on Web pages
- Finding the number of rows
- Inserting, deleting and updating data
- Executing multiple queries

Unit 11: State Management [6]

- Cookies
  - What is a Cookie?
  - Setting time in a cookie with PHP
  - Deleting a cookie
  - Creating session cookie
  - Working with the query string

- Session
  - What is session?
  - Starting a session
  - Registering Session variables
  - working with session variables
  - destroying session
  - passing session Ids
  - encoding and decoding session variables
  - How to increase session expire time
  - How to work session without cookie?

Reference Books:-

- PHP: The Complete Reference-Steven Holzner.
- Professional PHP 5-Ed Lecky-Thompson,Heow Eide-Goodman, Steven D. Nowicki, Alec Cove.
- Programming PHP- Rasmuslerdorf, Kevin Tatroe.
- Beginning PHP 5.3 –Wrox Plublication-Matt Doyle
- Learning php, mysql, javascript and css –Oreilly- Robin Nixon

Paper Code: BCA405

E-Commerce

Max. Marks: 100

External Assessment: 70

Internal Assessment: 30

Unit 1: Introduction to electronic commerce [10]

• Electronic commerce: The scope of electronic commerce, definition of electronic

Commerce, Electronic commerce and the trade cycle, electronic markets, electronic data interchange, internet commerce, e-Commerce Perspectives.

Unit 2: Business strategies in an electronic Age. [10]

• The Value chain: Supply Chains, Porter's Value chain Model, Intel Organizational value chains.

• Competitive Advantages: Competitive Strategies, Porter's Model, First Mover Advantages

• Business strategy:

Introduction to business strategy, Strategic Implication of IT, Technology, Business Environment, Business capability, Exiting business strategy, Strategy formulation and Implementation plan, E-Commerce Implementation, E-Commerce Evaluation.

* Case Study: e-Commerce in Passengers air Transport

- Airline Booking system
- Booking system

Unit 3: Business to Business Electronic commerce [15]

- Inter-organizational Transactions: Inter-organizational Transactions, The credit Transaction Trade cycle, A Variety of Transactions, Pens and Things
- Electronic markets: Markets, Electronic markets, Usages of electronic markets, Advantages and disadvantages of electronic markets, Future of electronic markets,
- Electronic data interchange (EDI): Introduction to EDI, EDI Definition, The benefits of EDI, EDI Example
- The Elements of e-commerce: Elements, E-visibility, The e-shop, Online Payments, Delivering the goods, After sales service, Internet e-commerce security, A web site evaluation Model

Unit 4: E-Business [10]

Introduction, Internet bookshops, Grocery supplies and support, Electronic newspapers, Internet banking, Virtual Auctions, Online share dealing, Gambling on the Net,

E-Diversity

Unit 5: E-Payment System [10]

Introduction, Types of Electronic Payment system, Payment Types, Receipts of Payments, The Traditional Payment System, Modern Payment System, Electronic cash, The steps for electronic Payment, Payment security.

Reference Books:

1) E-Commerce by David Whitley Tata McGraw-Hill.
2) E-Commerce by C.S.V. Murthy.

Paper Code: BCA406

LAB COURSE-4

Practical Paper-I based on- Paper Code BCA402
Practical Paper-II based on- Paper Code BCA404

Max. Marks: 100

Internal Assessment: 100

Practical Paper-I based on Paper Code BCA402

1) Consider the following table and solve the following queries:
Table Name: employee

Column_name	Datatype	Constraint
Eno	Number(5)	Primary key
Ename	Varchar2(20)	Not Null
Eaddr	Varchar2(20)	Not Null
Edname	Varchar2(20)	Not null
Emgr	Number(5)	Not null
Edoj	Date	Not null
Esal	Number(9,2)	Not null

1. Insert at least 10 records.
2. Sort the employee list according to joining date.
3. Increase 5% salary whose joining date is before 2010.
4. Display the names of employees in ascending order of employee name.
5. List the department name,no. of employees in each department
6. Remove the employees who works in 'account' dept.
7. Raise the salary of all 'salesman' by 20%.
8. Display the names of employees whose dept names are sales,purchase,production.
9. Display the all details of employees whose names starts with character 'A'.
10. Rename table by emp_detail

2) Write a PL/SQL block of code to calculate face value.

3) Write a PL/SQL block of code to check no is palindrome or not.

4) Write a PL/SQL block of code to find grade of the student from percentage.

5) Define a cursor that will accept book name and author name & display all information of book. Book(bid, bname, bauthor, bprice, bedition).

6) Define a trigger after insert for every row in stud_marks table, whenever marks entered is <0 or >100, Raise an application error and display corresponding message.

Practical Paper-II based on- Paper Code BCA404

1) Write PHP code to check entered number is Armstrong or Not.
2) Write a menu driven program to perform following operations:
    a) Check Number is Palindrome or not.
    b) Check Number is Perfect or not.
    c) Find face value of Entered number.
    d) Check Number is Prime or not.
    e) Check Number is Strong or not.
3) Write a PHP code to perform following operations:
    a) Sort array element
    b) Find Maximum and Minimum number in array
    c) Merge two arrays in third array.
    d) Swap two array elements
4) Write a program to overload the constructor.
5) Write a program which uses the static methods and static variables.
6) Write a program to implement different types of inheritance.
7) Write a program to implement interface.
8) Write a program to handle different types of exceptions.
9) Write a program which shows the use of 'final' keyword.
10) Write a program to copy the content of one file into another.
11) Write a program to merge two files into third file.
12) Design a web application to perform following task on employee table.

I) Add New II) Save III) Delete IV) Update V) Move First VI) Move Last

13) Design a web application that uses cookies and session object.