COURSE STRUCTURE, SYLLABUS AND SCHEME OF EXAMINATION

FOR

B.A./B.Sc./B.Com

Computer Applications

Session 2018-19

Department of Computer Applications

VBS PURVANCHAL UNIVERSITY, JAUNPUR

DEPARTMENT OF COMPUTER APPLICATIONS
VBS PURVANCHAL UNIVERSITY, JAUNPUR

STUDY & EVALUATION SCHEME

B.A./B.Sc./B.Com Computer Applications
Session: 2018-2019

Year I

SUB CODE	SUBJECT	TOTAL
BA-101	PC SOFTWARE	35
BA-102	COMPUTER ORGANIZATION	35
BA-103	PROGRAMMING PRINCIPLES & C LANGUAGE	35
BA-104	FUNDAMENTAL OF IT	35
BA- L11	C PROGRAMMING LAB	60

TOTAL

Year II

SUB CODE	SUBJECT	TOTAL
BA-201	FUNDAMENTAL OF INTERNET	35
BA-202	C++ PROGRAMMING	35
BA-203	DATA AND FILE STRUCTURE	35
BA-204	DATA BASE MANAGEMENT SYSTEM	35
BA-L21	DBMS and C++ LAB	60

TOTAL

Year III

SUB CODE	SUBJECT	TOTAL
BA-301	WEB DESIGN	50
BA-302	SOFTWARE ENGINEERING	50
BA-303	PRINCIPLES OF OPERATING SYSTEM	50
BA-L31	PROJECT	150

TOTAL

PC SOFTWARE
BA 101

Unit-I
Introduction:
Definition of a PC and its components, Concept of software, Hardware and firmware, Types of software, Difference between a program and software.

Unit-II
MS DOS:
Basic Operating system concept, CUI, Concept of files and directories, Booting of the system, Internal and External DOS commands, Partition of disk, Limitation of DOS.

Unit – III
MS Windows:
Basic multiprogramming concept, GUI, Folders, Concept of login and logout, My Document, My Computer, My Network, Recycle Bin, Start Button, Task Bar, Date and Time setting, Calculator, WordPad, System tools.

Unit – IV
MS-Office:
MS World: Opening, Creating, Saving a document, Editing, Finding and Replacing Texts, Using the Interface (Toolbars and Menus)
MS Excel: Concept of Workbook, Opening, Creating, Saving a workbook and organization of worksheets in a workbook, Data entry in cell, Selecting/Copying/Moving data in a worksheet.
MS Power Point: Business presentation and their advantages. Opening, Creating, saving a presentation.

Books:
1. Office 2000
2. Sanjay Saxena : A first course in Computers

COMPUTER ORGANIZATION
BA 102

Unit – I
Number System
Introduction, Binary, Octal & Hexadecimal number system, Conversion form decimal to binary, octal & hexadecimal ect, Representation of numbers in computer and various character codes.

Unit – II
Logic Gates
Boolean algebra, Minterms, Maxrerms, Simplification of Boolean functions, K-Map simplification, Half adder, Full adder, Decoder, Encoder, Multiplexer, Demultiplexer, Binary counters, Flip-Flops.

Unit – III
Memory Organization
RAM, ROM, Auxiliary memory, Memory Hierarchy, Associative memory, Virtual memory, Cache memory, Memory management hardware.

Unit – IV
Input-Output Organization
Peripheral devices, I/O interface, Direct memory access, Type of commands, Modes of transfer, Asynchronous data transfer, Strobe control, Handshaking, DMS transfer, IOP

Unit – V
Processor Organization
Formats, Single Accumulator organization, General register organization, Stack organization, Addressing modes, data transfer and manipulation.

Book:

1. Computer System Architecture, M. Mano(PHI)
2. Computer Organization, Vravice, Zaky & Hamacher (TMH Publication)
3. Structured Computer Organization, Tannenbaum(PHI)
4. Computer Organization, Stallings(PHI)
5. Computer Organization, John P.Hayes (McGraw Hill)

PROGRAMMING PRINCIPLES AND C LANGUAGE
BA 103

Unit – I
Introduction
Algorithm, Flowcharts, Introduction of programming languages, History of C, Basic structure of C Programming, Executing C Program

Data Types
Constant, variables, Identifiers, Keywords, Tokens, Declaration of Variables, Assigning values to variables.

Operators
Arithmetic, Relational, Logical, Assignment, Increment, Decrement operators, Condition, Bit wise operators, Arithmetic expressions.

Unit – II
Branching & Looping
Decision making with if, If-else, Switch Statement, GOTO statement, While loop, Do While loop, FOR Loop, Break and Continue statements.

Array
One dimensional array, Two dimensional array, Multidimensional array, Initializing array.

Unit – III
Function
Function declaration, calling a function, The form of C function, Return values and their type, No arguments, no return value, arguments but no return, recursion, Nesting of function.

Pointers
Accessing address of a variable, declaring and initializing pointers, pointer expression, pointer and array, pointer and function, pointer and structure, pointer to pointer

Unit – IV
Structure & Union
Structure definition, giving values to members, structure initialization, Array of structure, structure within structure, Size of structure, Union definition

Unit – V
File Handling
Defining and opening file, closing a file, I/O operations on file. Random access to file, Error handling in file.

Books:
1. Programming in C: Gottfried
2. Programming in ANSI C: E. Balaguruswamy
3. Let us C : Y. Kanetkar

FUNDAMENTAL OF INFORMATION TECHNOLOGY
BA 104

Unit – I
Introduction
Definition of an Electronic Digital Computer, characteristics, capabilities and limitation of computer, Generation of computers, Types of computers, Classification of computers on size, Computer Hardware components and their functions, Characteristics and Applications of Computers.

Unit – II
Operating system concepts
Introduction to OS, components of OS, Types of OS, multiprogramming, multitasking & time sharing, File & Directories & their use in different OS, DOS operating system, Window operating system, Unix operating system

Unit – III
Software:
Need, Types of software – System software, Application software, Utility programs, Introduction to programming languages, Assembler, Compiler and Interpreter, Programming languages – Assembly language, Machine level language, High level language. Application software.

Unit – IV
Data Communication & networks:
Types of Network – LAN, MAN, WAN, Internet, Intranet, Topologies of LAN – Ring, Bus, Star, Mesh and Tree.

Unit – V
Tools for Program Development:
Algorithms, Flow charts – symbols, Rules for making flow chart, Types of flow chart, advantage and disadvantage, Pseudo codes, Programming techniques – Top Down, Bottom-up, Modular, Structured.

Books:
1. Computer & Languages: A. Arora & S. Bansal
2. Computer Fundamental: B. Ram
3. Information Technology: D. Cyganski & J.A. Orr
4. fundamentals of information technology: Leon & Leon

FUNDAMENTALS OF INTERNET
BA 201

Unit - I
Introduction: What is Internet? - Using the Internet, Understanding the Internet: Clients and Servers – X Windows and X Clients – Hosts and Terminals, ARPANET - Internet service providers – Protocol – How does the Internet work?

Unit - II
World Wide Web: Basic Features – Web Browsers – Web Servers – Search Engines – Hypertext – what is a Browser? – Basic Features of Web Browsers – Working with Internet Explorer.

Unit - III

Mail: SMTP – Accessing the Mail System – Mail Headers – Signatures – Mail Addresses – Sending Mail – Reading Mail – Replying to a message – Forwarding and Bouncing Mail – Folders. Overview of Talk Facilities.

Unit - IV
A Tour of the Internet: Web- Web Search Engines – Usenet – Gopher – Veronica and Jughead – Anonymous ftp – Archie – Mailing list – Telnet – Internet Relay Chat - Internet Addressing.

Unit - V
Internet Structure, Protocol, and Access: Overview – Internet Protocol Model Overview – Internet Addresses – Internet Protocol – Internet Access – Internet Applications – Future of the Internet and Internet related Applications.

Books:
1. Harley Hahn. 1997. The Complete Reference, 2nd Edition, Tata McGraw Hill, New Delhi.[Unit-1 :- 1-5,9-18,60 Unit-2 :-93-95,99-106,111,112-116,400 Unit-4:- 24-30]
2. Ashok Lodha. 2007. Internet and E-Mail, 1st Edition, Law Point, New Delhi.
3. Daniel Minoli. 1999. Internet and Intranet Engineering, Tata McGraw-Hill, New Delhi.

C++ PROGRAMMING
BA 202

Unit – I
Introduction:
OOP Paradigm, Basic concepts, Benefits and its applications, Basics of C++, Concepts of structure and class, Private and public members, tokens, data types, dynamic initialization, reference variable, operators, dynamic memory allocation, manipulators, control structure.

Unit – II
Functions in C++:
Introduction, main() function, prototyping, call and return by reference, inline function, default arguments, function overloading, friend functions, private member functions, various storage classes, static member functions.

Unit – III
Constructor and Destructor:
Introduction, parameterized constructors, multiple constructors in a class, constructors with default arguments, dynamic initialization of objects, copy constructor, destructors.

Unit – IV
Operator Overloading:
Introduction, definition, method of overloading, Overloading unary and binary operators, manipulation of strings using operators, rules for overloading oprators.

Unit – V
Inheritance:
Definition, base and derived classes, type of inhreitence and their implementation, virtual base classes, abstract class.

Dynamic Polymorphism:
Introduction, pointers to object, this pointer, pointers to derived class, virtual functions, pure virtual functions.

Books:
1. Object oriented programming with C++: Balaguruswamy
2. Object oriented programming: Budd
3. Object oriented programming with C++: R. Lafore

DATA & FILE STRUCTURE
BA 203

Unit – I
Introduction
Basic Technology, Elementary data organization, Data structure operations, Algorithm Complexity.

Unit – II
Array:
Array Definition, Representation and analysis, Single and Multidimensional arrays, Address calculation, Application arrays, Character string in C, Character string operation, Array as parameters, Ordered list, sparse matrix and vectors.

Unit – III
Stack and Queue and Link List:
Static & Dynamic data structure, definition, concepts, algorithms and application of stack & queues, linked stack & queue, linked list operation, doubly linked list.

Unit – IV
Tree and Graph:
Definition & concept of tree, binary tree, conversion of general tree to binary tree, tree-traversal, rotation of tree, balanced tree, graphs, traversal, connected components & spanning tree, shortest path & transitive closure.

Unit – V
Searching & sorting
Sequential search, binary search, searching algorithms & their analysis, bubble sort, insertion sort, selection sort, analysis of sorting algorithms, quick short.

Books:
- E. Horowitz & Sahini, "Data Structure", Galgotia
- Tenebaum, "Data Structure & program design in C" PHI
- Lipschutz, "Data Structure" TMH

DATABASE MANAGEMENT SYSTEM

BA 204

Unit- I

Introduction:

An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure.

Unit- II

Data Modeling using the Entity Relationship Model:

ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model.

Unit- III

Relational data Model and Language: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra.

Unit- IV

Introduction to SQL: Characteristics of SQL. Advantage of SQL. SQL data types and literals. Types of SQL commands. SQL operators and their procedure. Tables, Queries and sub queries. Aggregate functions. Insert, update and delete operations. Joins, Unions, Intersection, Minus.

Unit- V

Data Base Design & Normalization:

Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependences, loss less join decompositions.

Text Books

1 Date C J, "An Introduction To Database System", Addision Wesley
2 Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
3 Elmasri, Navathe, "Fundamentals Of Database Systems", Addision Wesley
4 Leon & Leon, "Database Management System", Vikas Publishing House.

WEB DESIGN
BCA 301

Unit – I
Overview of Internet:
Introduction to Internet and WWW, Internet protocols like TCP/IP, http, telnet and ftp, url, email, domain name, Web Browsers, Search Engines, Counters, Chat & Bulletin Board Services.

Unit – II
Principles of Web Design: Key issues to be considered in web site design.
Structure of a Web Page:
Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, ordered and unordered lists, content layout & presentation.
HTML Tags: Use of Different HTML tags in web pages.
Table Handling : Table layout & presentation, constructing tables in a web page, developing a web page in a table.

Unit – III
HTML Editors & Tools: Use of different HTML editors and tools like Netscape Communicator and Microsoft Front Page etc.
Graphical and Animation Techniques: Use of Different graphical and animation tools like Abode Photoshop, Gif Animator etc.

Unit – IV
Interactivity: Client Server Model, Static & Dynamic Web pages, Creating forms, CGI, Role of Databases in web applications.

Unit – V
Web Technologies:
Overview of various web technologies and their applications like Java Script, active server pages, Macromedia flash, embedding java applets in a web page etc.

Books:
1. C. Xavier, "World Wide Web Design with HTML", Tata McGraw Hill.
2. Joel Sklar, "Principles of Web Design", Web Warrior series.
3. Rick Dranell, "HTML4 unleashed", Techmedia Publication.
4. Shelly Powers, "Dynamic Web Publishing Unleashed", Techmedia.
5. Don Gosselin, "JavaScript", Vikas Publication
6. Mark Swank & Drew Kittel, "World Wide Web Database", Sams net.

SOFTWARE ENGINEERING
BA 302

Unit – I
Introduction
Introduction to Software Engineering, Importance of Software, The feauters of software, Software development life-cycle.

Unit – II
Software requirement specification:
Software process, Water Fall Model, Incremental Model, Prototyping Spiral Model, Role of Management in Software development, Role of matrices and measurement, Problem analysis, Requirement specification, Monitoring and Control.

Unit – III
Software Design:
Design principles, Problem partitioning, Abstraction, Top-down and Bottom-up design, Structured approach, Functional versus Object oriented approach, Design specification and Verification, Monitoring and Control, Cohesiveness, Coupling, Forth generation techniques, Functional independence, Software architecture.

Unit – IV
Coding:
Top-down and Bottom-up programming, Structured programming, Information hiding, Programming style and internal documentation.
Testing: Testing principles, Levels of testing, Functional testing, Structural testing, Test plane, Test case specification, Reliability assessment, Software testing strategies, Verification and validation, Un**it** testing, Integration testing, Alpha and Beta testing, system testing and debugging.

Unit – V
Software Project Management:
The Management spectrum – (The people, The product, the process, the project), Cost estimation, project scheduling, Staffing, Software Configuration management, Structured V_S Unstructured maintenance.

Book:
- Pressman, "Software Engineering: A practitioner's approach", TMH
- Pankaj Jalote, " Software Engineering", Narosa
- Ghezzi, Carlo and Others, "Fundamental of Software Engineering", PHI.

PRINCIPALS OF OPERATING SYSTEM
BA 303

Unit – I
Introduction
Operating system and functions, evaluation of operating system, batch, interactive, time-sharing & real time systems, System protection, system components, system structure, operating system services.

Unit – II
Concurrent process
Process, state transition, interrupts, process control block, principle of concurrency, producer-consumer problem, critical section,

Unit – III
CPU scheduling
Scheduling concept, performance criteria, scheduling algorithms such as FCFS, SJF, Round-Robin.
Deadlock
System model, deadlock characterization, prevention.

Unit – IV
Memory Management
Real storage, resident monitor, multiprogramming with fixed partition, multiprogramming with variable partition, multiple base register, paging, segmentation, paged segmentation, virtual memory concept, demand paging, page replacement algorithms, allocation of frames, thrashing, cache memory organization, impact on performance

Unit – V
UNIX/LINUX
Unix system kernel & Utilities, File & Directories, Single & compound statement, basic commands, Bourn shell, korn shell & C shell, shell meta characteristics, shell variables & scripts, environment, integer arithmetic & string manipulation, decision making.

Books:
1. Operating system : Paterson
2. Operating system: Andrew S. Tannebaum
3. Operating System: W. Stalling