COURSE STRUCTURE, SYLLABUS AND SCHEME OF EXAMINATION

FOR

BACHELOR OF COMPUTER APPLICATION
(BCA)

2020-21 Onwards

Department of Computer Applications

VBS PURVANCHAL UNIVERSITY, JAUNPUR

DEPARTMENT OF COMPUTER APPLICATIONS

VBS PURVANCHAL UNIVERSITY, JAUNPUR

STUDY & EVALUATION SCHEME

BCA (Bachelor of Computer Applications)

SEMESTER III

SUB CODE	SUBJECT	L	T	P	TA/CT/ESE	TOTAL
BCA-301	COMPUTER BASED NUMERICAL & STATISTICAL TECHNIQUES	3	1	0	10/20/70	100
BCA-302	SOFTWARE ENGINEERING	3	1	0	10/20/70	100
BCA-303	PRINCIPLES OF OPERATING SYSTEM	3	1	0	10/20/70	100
BCA-304	JAVA PROGRAMMING	3	1	0	10/20/70	100
BCA-L31	CBNST LAB	0	0	3	30/70	100
BCA-L32	JAVA LAB	0	0	3	30/70	100

TOTAL – 600

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES
BCA 301

Unit – I
Floating Point Arithmetic:
Representation of floating point number, Operations, Normalization, Pitfalls of floating point representation, Error in numerical computation.
Iterative Methods:
Bisection methods, Regula-Falsi method, Newton-Raphson method.

Unit – II
Simultaneous Linear Equations:
Solution of systems of linear equations, Gauss elimination direct method and Pivoting, Ill conditioned system of equations, Refinement of solution, Gauss Seidal method.

Unit – III
Interpolation and approximation:
Finite differences, Difference tables, Polynomial Interpolation: Newton forward and backward formula. Central Difference formula: Gauss forward and backward formula.
Interpolation with unequal intervals:
Langrange's interpolation, Newton Divided difference formula.

Unit – IV
Statistics:
Statistics and its role in decision making, Internal and external source of data, Formation of frequency distribution and types of frequency distribution, Simple and weighted mean, median and mode.

Unit – V
Correlation:
Significance of study of Correlation, Types of Correlation: Positive and Negative correlation, Simple, Partial and Multiple Correlation, Linear and Non-linear correlation, Coefficient of Correlation, Use of Regression analysis, Difference between correlation and regression analysis, Regression Lines: Regression equation of Y on X and X on Y.

Books:
1. Rajaraman, "Computer Oriented Numerical Methods", PHI
2. Gerald and Wheatly, "Applied numerical Analysis", AW.
3. Pradip Niyogi, "Numerical Analysis and algorithms", TMH.

SOFTWARE ENGINEERING
BCA 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:
1. Pressman, "Software Engineering: A practitioner's approach", TMH
2. Pankaj Jalote, " Software Engineering", Narosa
3. Ghezzi, Carlo and Others, "Fundamental of Software Engineering", PHI.

PRINCIPALS OF OPERATING SYSTEM
BCA 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

JAVA PROGRAMMING
BCA 304

Unit – I
Introduction to Java : Importance and features of java, keywords, constants, variables and data types, Operators and expressions, Decision making, branching and looping: if.. else, switch, ?: operator, while, do, for statements, labeled loops, jump statements : break, continue, return.
Introducing classes , objects and methods: defining a class, adding variables and methods, creating objects, constructors, class inheritance.

Unit – II
Arrays and strings : creating an array, one and two dimensional arrays, string array and methods, String and String Buffer classes, Wrapper classes.
Inheritance : Basics types, using super, Multilevel hierarchy abstract and final classes, Object class, Packages and interfaces, Access protection, Extending Interfaces, packages.

Unit – III
Exception Handling : Fundamentals exception types, uncaught exceptions, throw, throw, final, built in exception, creating your own exceptions.
Multithreaded Programming : Fundamentals, Java thread model: priorities, synchronization, messaging, thread class, Runnable interface, interthread Communication, suspending, resuming and stopping threads.

Unit – IV
Input/Output : Basics, Streams, Byte and Character stream, predefined streams, Reading and writing from console and files. Using Standard Java Packages (lang, util, io, net).
Networking : Basics, networking classes and interfaces, using java.net package, doing TCP/IP and Datagram Programming.

Unit – V
Event Handling : Different mechanism, the Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter and Inner Classes, Working with windows, graphics and text, using AWT controls, Layout managers and menus, handling Image, animation, sound and video, Java Applet.

Books:
1. James Rumbaugh etal, "Object Oriented Modeling and Design", PHI
2. Herbert Schieldt, "The Complete Reference: Java", TMH.
3. E. Balagurusamy, "Programming in JAVA", TMH.