Jai Prakash University

SYLLABUS

FOR

(BCA)

Regular & Distance Mode

(3 Year Course)

Bachelor of Computer Application

Syllabus Committee Member

1. Prof. P.K. Mishra,
   Department of Computer Science,
   Faculty of Science BHU, Varansi

2. Dr. S. Karthikeyan
   Department of Computer Science,
   Faculty of Science BHU, Varansi

3. Dr. Manjari Gupta
   Department of Computer Science,
   Faculty of Science BHU, Varansi

Signature
SYLLABUS

For

Bachelor of Computer Applications

(BCA)

Regular & Distance Mode

(Three Years Course)
Bachelor of Computer Applications  
FIRST SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
</tr>
</thead>
<tbody>
<tr>
<td>1BCA1</td>
<td>Introduction to Computers &amp; IT</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>1BCA2</td>
<td>Introduction to Programming Language using C</td>
<td>4</td>
<td>25</td>
<td>75</td>
<td></td>
</tr>
<tr>
<td>1BCA3</td>
<td>Mathematics</td>
<td>3 hours</td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>1BCA4</td>
<td>Foundation course in English</td>
<td></td>
<td>3</td>
<td>25</td>
<td>75</td>
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</table>

**PRÁCTICAS**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
</tr>
</thead>
<tbody>
<tr>
<td>1BCA5</td>
<td>Practical based on 1BCA2</td>
<td></td>
<td>3</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>1BCA6</td>
<td>PC software</td>
<td>2</td>
<td>40</td>
<td>60</td>
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</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>2 hours</td>
<td>20</td>
<td>180</td>
<td>420</td>
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</tbody>
</table>

**TOTAL MARKS:** 600
Bachelor of Computer Applications  
SECOND SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
</tr>
</thead>
<tbody>
<tr>
<td>2BCA1</td>
<td>Digital Logic and Circuits</td>
<td>3 hours</td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>2BCA2</td>
<td>Numerical Methods</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>2BCA3</td>
<td>Data Structure Using ‘C’</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>2BCA4</td>
<td>Principles of Management</td>
<td></td>
<td>3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2BCA5</td>
<td>Practical based on 2BCA2</td>
<td>2 hours</td>
<td>2</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>2BCA6</td>
<td>Practical based on 2BCA3</td>
<td></td>
<td>3</td>
<td>40</td>
<td>60</td>
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<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>20</td>
<td>180</td>
<td>420</td>
</tr>
</tbody>
</table>

**TOTAL MARKS: 600**

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on ................., & Sub-Committee Academic Council held ...................... W.e.f. academic session .................
# Bachelor of Computer Applications
## THIRD SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
</tr>
</thead>
<tbody>
<tr>
<td>3BCA1</td>
<td>Computer Organization</td>
<td>3 hours</td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>3BCA2</td>
<td>Discrete Mathematics</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>3BCA3</td>
<td>Object Oriented Programming using C++</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>3BCA4</td>
<td>Principles of Accounting</td>
<td></td>
<td>3</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td><strong>PRACTICALS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3BCA5</td>
<td>Practical based on 3BCA2</td>
<td></td>
<td>2</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>3BCA6</td>
<td>Practical based on 3BCA3</td>
<td></td>
<td>3</td>
<td>40</td>
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</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td>2 hours</td>
<td>180</td>
<td>420</td>
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</tbody>
</table>

**TOTAL MARKS: 600**
Bachelor of Computer Applications  
FOURTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
</tr>
</thead>
<tbody>
<tr>
<td>4BCA1</td>
<td>System Analysis &amp; Design</td>
<td>3 hours</td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>4BCA2</td>
<td>Operating System</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>4BCA3</td>
<td>Database Management Systems</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>4BCA4</td>
<td>Java Programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| PRACTICALS |                                    |                         |         |                |                |
| 4BCA5      | Practical based on 4BCA3            |                         | 2       | 40             | 60             |
| 4BCA6      | Practical based on 4BCA4            |                         | 3       | 40             | 60             |
| **Total**  |                                    |                         | 20      | 180            | 420            |

TOTAL MARKS: 600

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on Sub-Committee Academic Council held W.e.f. academic session
Bachelor of Computer Applications  
FIFTH SEMESTER EXAMINATION  

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
</tr>
</thead>
<tbody>
<tr>
<td>5BCA1</td>
<td>Computer Networks</td>
<td>3 hours</td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>5BCA2</td>
<td>Human Computer Interaction</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>5BCA3</td>
<td>Web Technologies</td>
<td></td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>5BCA4</td>
<td>E- Commerce</td>
<td></td>
<td>3</td>
<td>25</td>
<td>75</td>
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</table>

**PRACTICALS**

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
</tr>
</thead>
<tbody>
<tr>
<td>5BCA5</td>
<td>Technical Writing and Seminar</td>
<td>3</td>
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<td>100</td>
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<tr>
<td>5BCA6</td>
<td>Internet Programming</td>
<td>2</td>
<td>40</td>
<td>60</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>2 hours</td>
<td>20</td>
<td>140</td>
<td>460</td>
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</table>

TOTAL MARKS: 600

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Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on .................. & Sub-Committee Academic Council held.................. W.e.f. academic session ..................
Bachelor of Computer Applications
SIXTH SEMESTER EXAMINATION

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Paper</th>
<th>Duration of Examination</th>
<th>Credits</th>
<th>Marks Internal</th>
<th>Marks External</th>
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<tbody>
<tr>
<td>THEROY PAPERS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6BCA1</td>
<td>Introduction to Multimedia System</td>
<td>3 hours</td>
<td>4</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td></td>
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<tr>
<td>PRACTICALS</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6BCA2</td>
<td>Dissertation</td>
<td>12</td>
<td>-</td>
<td>300</td>
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<tr>
<td>6BCA3</td>
<td>Comprehensive Viva</td>
<td>4</td>
<td>400</td>
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<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>125</td>
<td>325</td>
<td></td>
</tr>
</tbody>
</table>

Note:
1. The total number of credits of the BCA programme = 300.
2. Each student shall be required to appear for examinations in all courses. However, for the award of the degree a student shall be required to earn the minimum of 150 credits.

Total Marks : 500

*Evaluation shall be based on Project Training, held after Fourth Semester and shall be conducted by the University only.
Paper Code: IBCAI
Paper: Introduction to Computers & IT


Computer Hardware: Major Components of a digital computer, Block Diagram of a computer Input-output devices, Description of Computer Input Units, Output Units, CPU.

Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to construct Memories, Magnetic Hard disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives.

Interaction with Computers Computer Software: System software, assemblers, compilers, interpreters, linkers Elementary Operating System concepts, different types of operating systems, Computer Programming and Languages: Algorithms, flow chart, decision tables, pseudo code, Low level languages and introduction to high level languages.

Computer Number System: ASCII Codes, EBCDIC codes, Gray codes, Unicodes.

Computer Network & Internet Basic elements of a communication system, Data transmission modes, Data Transmission speed, Data transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), Client and Servers, Intranet, Extranet,

Internet Terminologies related to Internet: Protocol, Domain name, IP address, URL, World Wide Web, Overview of various services on Internet: E-mail, FTP, Telnet, Chat, Instant Messaging.

Suggested Readings:

2. Vikas Gupta, “Comdex Computer Kit”, Wiley Dreamtech, Delhi, 2004

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on ............... & Sub-Committee Academic Council held ...................... W.e.f. academic session ...............
Paper Code: IBCA2
Paper: Introduction to Programming Language using C

C basics: C character set, Identifiers and keywords, Data types, constants, variables and arrays, declarations, expressions statements, symbolic constants, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, conditional operators, bit operators.
C constructs: If statement, if...else statement, if...else if...else statement, while statement, do...while statement, for statement, switch statement, nested control statement, break operator, continue operator, comma operator, goto statement.

Arrays: Arrays, pointers, array & pointer relationship, pointer arithmetic, dynamic memory allocation, pointer to arrays, array of pointers, pointers to functions, array of pointers to functions, Preprocessor directives: #include, #define, macro's with arguments, the operators # and ##, conditional compilations.

Structures: Structures, unions, passing structure to functions, bit fields, file handling [text (ASCII), binary, String manipulation functions and other standard library functions from stdio.h, stdlib.h, conio.h, ctype.h, math.h, string.h, process.h. Usage of command line arguments.

Suggested Readings:

4. Using The GNU Compiler Collection, Richard M. Stallman; The GCC Developer Community Pothi.com

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on .................. & Sub-Committee Academic Council held.................. W.e.f. academic session ..................
Paper Code: BCA3
Paper: Mathematics


LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities.

DIFFERENTIATION: Derivative, Derivatives of Sum, Differences, Product & quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor’s), Indeterminate Forms, L'Hospital's Rule, Maxima & Minima, Asymptote, Successive Differentiation & Liebnitz Theorem.

INTEGRATION: Integral as Limit of Sum, Riemann Sum, Fundamental Theorem of Calculus, Indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Integration of Algebraic and transcendental Functions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions.

Suggested Readings:
Paper code-IBCA4
Paper: Foundation course in English

Writing paragraph-1, Writing paragraph-2, the development of a paragraph Writing a composition, Expository composition, Note-taking-1, Writing reports-1, reporting events, Argumentative composition-1, techniques of argument, Argumentative composition-1, logical presentation, Note taking-2, use of tables and diagrams, Writing reports-2, reporting meetings and speeches, Writing summaries-1, Writing summaries-2 Writing paragraphs-2, Narrative composition-1, Narrative composition-2, Writing reports-3, reporting interviews, Writing reports-4, reporting surveys, Writing summaries-3, Descriptive composition-1, describing persons, Descriptive composition-2, describing places and objects, Descriptive composition-3, describing, conditions and processes, Note-taking-3, Writing reports-5, reporting experiments, Summing up

Suggested Readings:

- A practical English grammar by Thomson and Martinet
- English grammar by W.S. Allen
- Intermediate English grammar by Raymond Williams
- Vocabulary by Michael mc earhu and felicity Odell
- English grammar by Jayanthi Dakshina Murth
Paper Code: 2BCA1

Paper: Digital Logic and Circuits

Number System: Binary, Octal, and Hexadecimal numbers; Fixed and Floating Point Number Representations, number base conversion, Complements, Binary Arithmetic: Addition, Subtraction, Multiplication and Division, Binary Codes.

Boolean algebra and Logic Gates: Introduction to Boolean algebra, laws of Boolean algebra, logic gates, universal logic gates, POS and SOP notations, Canonical logic forms, Logic families.


Combinational Circuits: Design Procedure of Combinational Circuits. Adders, Subtractors, Code Converters, Magnitude Comparator, Encoder, Decoder, Multiplexer, Demultiplexer, ROM, PLAs, PALs.

Sequential Circuits: Flip-Flops: SR, D, JK, T, Master/Slave F/F, Edge-triggered F/F, Excitation Tables; Registers, Counters: synchronous and asynchronous, Shift Registers, RAM.

Logic Families: TTL, ECL, E2L, CMOS, Characteristics of different logic families.

Suggested Readings:

1. M. M. Mano, Digital Logic and Computer Design, PHI.
2. M.M. Mano, Computer System Architecture, PHI.

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on ................. & Sub-Committee Academic Council held ............... W.e.f. academic session ...............
Paper Code: 2BCA2
Paper: Numerical Methods

- Bisection, Falsiposition and Newton-Raphson methods for solution of nonlinear equations.
- Errors in the solutions, Convergence of Solutions.

Suggested Readings:

1. V. Rajaraman, Computer Oriented Numerical Methods, PHI.
4. SS Shastri, "Introductory Methods of Numerical Analysis", PHI.
Paper Code: 2BCA3
Paper: Data Structures Using ‘C’

Introduction to Data Structures: Basic Terminology, Elementary Data Organizations, 
Classification of data structures and its operations.
Arrays: Representation of single and multidimensional arrays (up to three dimensions); sparse 
arrays - lower and upper triangular matrices and Tri-diagonal matrices; addition and subtraction 
of two sparse arrays. (Multidimensional, and, sparse arrays, to be given elementary treatment)
Stacks and Queues: Introduction and primitive operations on stack; Stack application; Polish 
Notations; Evaluation of postfix expression; Conversion from infix to postfix; Introduction and 
primitive operations on queues; De queues and priority queues.

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, 
insertion, deletion, searching, Two way lists and Use of headers
Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree 
operations such as traversal, insertion and deletion

Introduction to and creation of AVL trees and m-way search trees - (elementary treatment to be 
given); Multilevel indexing and B-Trees: Introduction; Indexing with binary search trees; 
Multilevel indexing, a better approach to tree indexes; Example for creating a B-tree.

Sorting Techniques: Insertion sort, selection sort and merge sort.
Searching Techniques: linear search, binary search and hashing. (Complexities NOT to be 
discussed for sorting and searching)

Suggested Readings:

1. R. Sethi, Programming Languages: concepts and constructs, Addison-Wesley, 1996.
5. B.W. Kernighan and D.M.Ritchie, the C Programming Language, PHI.
7. B.S. Gottfried, Schum’s Outline of Theory and Problems of Programming with C, McGraw-
Hill.

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on 
………………..& Sub-
Committee Academic Council held……………….. W.e.f. academic session ……………..
Paper Code: 2BCA4
Paper: Principles of Management

Management: Meaning & concept, Management principles (Fayol & Taylor), Management process (in brief), Managerial levels, Roles & skills of a manager, Management Theories (Classical, Neoclassical, Behavioral, Systems & Contingency) [Elementary]


Managing People - Meaning, Need of understanding human behavior in organization, Models of OB, Major concepts in OB (elementary)- Personality, Learning, Perception & Attitude Building.

Suggested Readings:

3. Peter F. Drucker : The Practice of Management
Paper Code: 3BCA1

Paper: Computer Organization


Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware

Suggested Readings:

Paper Code: 3BCA2
Paper: Discrete Mathematics

Propositional Calculus, Propositions, Logical Connectives, Disjunction, Conjunction, Negation, Conditional Connectives, Precedence Rule, Logical Equivalence, Logical Quantifiers

Methods of Proof, What is a Proof?, Different Methods of Proof, Direct Proof, Indirect Proofs, Counter Examples, Principle of Induction, Boolean Algebra and Circuits, Boolean Algebras, Logic Circuits, Boolean Functions

Basic Combinatorics, Sets, Relations and Functions, Introducing Sets, Operations on Sets, Basic Operations, Properties Common to Logic and Sets, Relations, Cartesian Product, Relations and their types, Properties of Relations, Functions, Types of Functions, Operations on Functions


Integer Partitions, Distributions, Distinguishable Objects into Distinguishable Containers, Distinguishable Objects into Indistinguishable Containers, Indistinguishable Objects into Distinguishable Containers, Indistinguishable Objects into Indistinguishable Containers

Suggested Readings:

Paper Code: 3BCA3

Paper: Object Oriented Programming using C++


Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, references, this pointer, Function Overloading, Constructors and destructors, instantiation of objects, Default parameter value, C++ garbage collection, dynamic memory allocation, Meta class/abstract classes.


Generic Programming – Introduction, templates, template functions, Overriding inheritance methods.

Files and Exception Handling: Persitant objects, Streams and files, Namespaces, The basic stream classes: C++ predefined streams, Error handling during file operations, Command Line Arguments. Types of Exception, Catching and Handling Exceptions.

Suggested Readings:

2. Let us C++ Kanetkar, BPB, 2nd Ed.
3. Object Oriented Programming with C++ E. Balagurusamy, TMH, 4th Ed.
5. C++ Programming Language Bjarne Stroustrup, Pearson, 3rd Ed.
Paper Code: 3BCA4
Paper: Principles of Accounting

Meaning and nature of accounting, Scope of financial accounting, Interrelationship of Accounting with other disciplines, Branches of Accounting, Accounting concepts and convention, Accounting standards in India.


Meaning of Inventory, Objectives of Inventory Valuation, Inventory Systems, Methods of Valuation of Inventories-FIFO, LIFO and Weighted Average Method, Concept of Depreciation, Causes of Depreciation, Meaning of Depreciation Accounting, Method of Recording Depreciation, Methods of Providing Depreciation.

Suggested Readings:

Paper Code: 4BCA1
Paper: System Analysis & Design


Suggested Readings:

Paper Code: 4BCA2  
Paper: Operating System


Memory Management: Background, Logical versus Physical Address, Swapping, Contiguous Allocation, Paging, Segmentation


Processes: Process Concept, Process Scheduling, Operation on Processes  
CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling, Process Synchronization; Background, Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary-Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap-Space Management, Disk Reliability

Suggested Readings:

4. Red Hat Bible Core Fedora Linux : Christopher Negus (Wiley Pub.)
5. Operating System : Andrew Tanenbaum, PHI, 3rd Ed.

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Paper Code: 4BCA3
Paper: Database Management System

Introduction: An overview of database management system, database system Vs file system, Characteristics of database approach, DBMS architecture, data models, schema and instances, data independence.

Data Modeling using Entity Relationship Model: Entity, Entity types, entity set, notation for ER diagram, attributes and keys, Concepts of composite, derived and multivalued attributes, Super Key, candidate key, primary key, relationships, relation types, weak entities, enhanced E-R and object modeling.

Introduction to SQL: Overview, Characteristics of SQL. Advantage of SQL. SQL data types and literals. Types of SQL commands: DDL, DML, DCL. Basic SQL Queries, Logical operators: BETWEEN, IN, AND, OR and NOT, Null Values: Disallowing Null Values, Comparisons Using Null Values, Integrity constraints: Primary Key, Not NULL, Unique, Check, Referential key, Introduction to Nested Queries, Correlated Nested Queries, Set-Comparison Operators, Aggregate Operators: The GROUP BY and HAVING Clauses, Joins: Inner joins, Outer Joins, Left outer, Right outer, full outer joins, Overview of views and indexes.

Relational Data Model: Relational model terminology domains, Attributes, Tuples, Relations, characteristics of relations, relational constraints domain constraints, key constraints and constraints on null, relational DB schema.Codd’s Rules Relational algebra: Basic operations selection and projection, Set Theoretic operations Union, Intersection, set difference and division, Join operations: Inner, Outer, Left outer, Right outer and full outer join. ER to relational Mapping: Data base design using ER to relational language, Data Normalization: Functional dependencies.

Transaction processing and Concurrency Control: Definition of, overview of serializability, serializable and non serializable transactions


Suggested Readings:

8. Practical Postgresql, By Joshua D. Drake, John C Worsley (O’Reilly publications)
Paper Code: 4BCA4
Paper: Java Programming


Exception Handling: Exception Class, built in checked and unchecked exceptions, user defined exceptions, use of try, catch, throw, throws, finally.
Multi threaded programming: Overview, comparison with multiprocessing ,Thread class and runnable interface, life cycle, creation of single and multiple threads, thread priorities, overview of Synchronization.
Java Library: String handling (only main functions), String Buffer class.
Elementary concepts of Input/Output :byte and character streams, System.in and System.out, print and println, reading from a file and writing in a file.


Suggested Readings:
1. Core Java 2 Volume - 1 Cay S Horstmann, Fary Cornell, Sun Microsystems Press, 8th Ed.
2. Core Java 2 Volume - II Cay S Horstmann, Fary Cornell, Sun Microsystems Press, 8th Ed.
4. Java 2 Complete Reference Patric Naughton, Herbert Schlitt, TMH,7th Ed.
5. Beginning Java Networking Chad Darby, John Griffin & others
Paper Code: 5BCA1
Paper: Computer Networks


Telephony: Multiplexing, error detection and correction, WDM, TDM, FDM, circuit switching, packet switching and message switching. Data Link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols overview. ISDN: Services, historical outline, subscriber’s access, ISDN, Layers, and broadband ISDN.

Devices: Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Network Layer Addressing and Routing concepts (Forwarding Function, Filtering Function); Routing Methods (Static and dynamic routing, Distributed routing, Hierarchical Routing); Distance Vector Protocol, Link State protocol.

Suggested Readings:

1. Computer Networks Andrew S. Tanenbaum, Pearson, 5th Ed
2. Data Communications and Networking Behrouz A. Forouzan, TMH, 4th Ed.
3. Cryptography and Network Security Atul Kahate, TMH, 2nd Ed.
4. Network Essential Notes GSW MCSE Study Notes
5. Internetworking Technology Handbook CISCO System
6. Computer Networks and Internets with
7. Internet Applications Douglas E. Comer

Syllabus of Bachelor of Computer Applications (BCA), approved by BCA Coordination Committee on .......... & Sub-Committee Academic Council held ................. W.e.f. academic session .................
Paper Code: 5BAC2
Paper: Human Computer Interaction


Suggested Readings:

1. Jon Carroll, Human- Computer Interaction in the New Millennium, 2002
History of the Internet and World Wide Web, Search Engines, News-group, E-mail and its Protocols, Web Portal, Browsers and their versions, Its functions, URLs, web sites, Domain names, Portals.
Static Web Development: HTML - Introduction to HTML, HTML Document structure tags, HTML comments, Text formatting, inserting special characters, anchor tag, adding images and Sound, lists types of lists, tables, frames and floating frames, Developing Forms, Image maps.
Introduction to Java Script: Data Types, Control Statements, operators, Built in and User Defined Functions, Objects in Java Script, Handling Events.
Cascading Style Sheet: Types of Style Sheets – Internal, inline and External style sheets, creating styles, link tag.
DHTML: Introduction to DHTML, JavaScript & DHTML, Document Object Model, Filters and Transitions, DHTML Events, Dynamically change style to HTML Documents.

Components of XML, XML Parser, DTD’s Using XML with HTML and CSS

Suggested Readings:

3. HTML, DHTML, JavaScript, Perl & CGI Ivan Bayross, BPB Pub, 3rd Ed.
4. Learning Query - Jonathan Chaffer, Karl Swedberg
7. Apache HTTP Server Reference Manual - for Apache version 2.2.17 – Apache Software Foundation
8. Internet Technology at work Hofstetter fred, TMH.
10. XML how to program Deitel & Deitel, Pearson Pub.
12. Web enabled commercial application development using HTML, DHTML, JavaScript, PERL,CGI, BPB Pub, 3rd Ed.
Paper Code: 5BCA4
Paper: E-commerce


Suggested Readings

Paper Code: 6BCA1
Introduction to Multimedia System


Multimedia and Animation, Basic of Animation, Types of Animation, Simulating Accelerations, Computer Animation Tools, Applications, Audio and Video format, Images, Audio and Video, Analog and Digital Sound and Video, Mpeg, mpi, wav, etc.


Suggested Readings: