RAYAT-BAHRA UNIVERSITY

University School of Management Studies

Study Scheme and Syllabus

Batch 2014-17

Programme : **Computer Applications**

Level : **Undergraduate**

Course : **BCA**

Study Scheme for BCA

Semester: 1st

S. No	Subject code	Subject Name	L	T	P	Credits
1	FS1101	Communication-I	4			4
2	BC1102	Programming in C	4			4
3	MA1103	Mathematics-I	5			5
4	BC1104	Information Technology	4			4
5	BC1105	Workshop On Web Development-I			4	2
6	BC1106	Software Lab-I (Programming in C)			4	2
7	BC1107	Software Lab-II (Information Technology)			4	2
8	FS1108	Finishing School-I	1		2	2
9	IE1109	Industry Interface				1
Total			18		14	26

Semester: 2nd

S. No	Subject code	Subject Name	L	T	P	Credits
1	BC1201	System Analysis & Design	4			4
2	FS1202	Communication-II	4			4
3	MA1203	Mathematics-II	5			5
4	BC1204	OOPS Using C ++	4			4
5	BC1205	Computer System Architecture	4			4
6	BC1206	Workshop On Web Development-II			4	2
7	BC1207	Software Lab-III (OOPS Using C++)			4	2
8	FS1208	Finishing School-II	1		2	2
9	IE1209	Industry Interface				1
Total			22		10	28

Semester: 3rd

S. No	Subject code	Subject Name	L	T	P	Credits
1	BC2301	Software Engineering	4			4
2	BC2302	Digital Electronics	3	1		4
3	BC2303	Operating Systems	3	1		4
4	BC2304	Workshop on PC-H/w	2		4	4
5	BC2305	Workshop on PHP	2		4	4
6	BC2306	Hardware Lab-I (Digital Electronics)			4	2
7	HV2307	Human Values and Professional Ethics	3			3
8	FS2308	Finishing School-III	1		2	2
9	IE2309	Industry Interface				1
Total			18	2	14	28

Semester: 4th

S. No	Subject code	Subject Name	L	T	P	Credits
1	BC2401	Data Structures-I	4	1		5
2	BC2402	Database Management Systems	3	1		4
3	BC2403	Workshop on Visual Basic	2		4	4
4	BC2404	Software Lab -IV(Data Structures-I)			4	2
5	BC2405	Software Lab-V (Database Management Systems)			4	2
6	EV2406	Environment Science	3			3
7	FS2407	Finishing School-IV	1		2	2
8	IE2408	Industry Interface				1
9	BC2409	Six Week industrial training				1
Total			13	2	14	24

Semester: 5th

S. No	Subject code	Subject Name	L	T	P	Credits
1	BC3501	Advanced database Systems	3	1		4
2	BC3502	Data Structures-II	3	1		4
3	BC3503	Core Java	4			4
4	BC3504	Project Work-I (Minor Project)	1		6	4
5	BC3505	Software Lab-VI (Core Java)			4	2
6	BC3506	Software Lab-VII (Advanced Database Systems)			4	2
7	FS3507	Finishing School-V	1		2	2
8	IE3508	Industry Interface				1
Total			15	2	16	26

Semester: 6th

S. No	Subject code	Subject Name	L	T	P	Credits
1	BC3601	Computer Graphics	3	1		4
2	BC3602	Computer Networks	3	1		4
3	BC3603	Workshop on asp.net	2		4	4
4	BC3604	Workshop on Advanced Java	2		4	4
5	BC3605	Software Lab-VIII (Computer Graphics)			4	2
6	BC3606	Project Work-II (Major Project)	1		6	4
7	FS3607	Finishing School-VI	1		2	2
8	IE3608	Industry Interface				1
Total			14	2	20	27

BCA 1st Semester Syllabus

BCA 1 Semester Syllabus

Sub code	Subject Name	L	T	P	C
FS1101	Communication-I	4	0	0	4

Objective:
The objective of this course is to make students understand that both oral & written communications are equally important. The students should be comfortable with both verbal & written communication.

Learning Outcome: Students should be able to understand spoken and written English language of varied complexity on most including some abstract topics; particularly the language of their chosen technical field.

Learning and Teaching Activities:
Unit-1

English Language: Sentence, Parts of speech, Tenses, Active passive voice, Direct Indirect speech, Creative writing& vocabulary, Comprehension passage, Reading of biographies of at least 10 IT business personalities (can be a home assignment or classroom reading).

Unit-2

Business communication-Types, Medias, Objectives, Modals, Process, Importance, Understanding Barriers to communication & ways to handle and improve barriers.

Unit-3

Presentation skills-Its Purpose in business world, How to find material for presentation, How to sequence the speech with proper introduction and conclusion, How to Prepare PPT & Complete set of required body language while delivering presentation.
Reading & writing skills- Importance of reading and writing, improving writing skill through understanding and practicing Notice, E-mail, Tenders, Advertisement, formal letter.

Unit-4

Listening skills-Its importance as individual and as a leader or as a worker, Its types, barriers to listening & remedies to improve listening barriers.
Non verbal Communication- Understanding what is called non verbal communication, its importance as an individual, as a student, as a worker and as a leader, its types.

References:
Text Books & Reference Books

1. Effective Business Communication, M.V. RODRIGUEZ

2. Business Communication, Meenakshi Raman, Parkash Singh, Paperback Edition, Oxford University Press.

Sub code	Subject Name	L	T	P	C
BC1102	Programming in C	4	0	0	4

Objective and Expected Outcome:

The objective of this course is to help the students in finding solutions to various real life problems and converting the solutions into computer program using C language (structured programming). Students will learn to write algorithm for solutions to various real-life problems. Converting the algorithms into computer programs using C language.

Unit-1

Algorithm and Programming Development: Steps in development of a program, Flow charts, Algorithm Development, Program Debugging, Compilation and Execution. Fundamentals of „C": I/O statements, Assignment Statements, Constants, Variables, Operators and Expressions, Standards and Formatted statements, Keywords, Data Types and Identifiers.

Unit-2

Control Structures: Introduction, Decision making with if – statement, if-else and Nested if, while and do-while, for loop. Jump statements: break, continue, goto, switch Statement

Functions: Introduction to Functions, Function Declaration, Function Categories, Standard Functions, Parameters and Parameter Passing, Call – by value/reference, Recursion, Global and Local Variables, Storage classes.

Unit-3

Arrays: Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices, Strings, String handling functions.

Structure and Union: Declaration of structure, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, Unions.

Unit-4

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays

Files: Introduction, Creating a data file, opening and closing a data file, processing a data file.

Preprocessor Directives: Introduction and Use, Macros, Conditional Preprocessors, Header Files.

References:

Text Books & Reference Books

1. Let us C, Yashvant P Kanetkar, Seventh Edition, BPB Publications, New Delhi.
2. Programming in ANSI C, E. Balagurusami, Fourth Edition, Tata McGraw Hill
3. Programming in C, Byron S. Gottfried, Second Edition, McGraw Hills.
4. The C Programming Language, Kernighan & Richie, Second Edition, PHI Publication
5. Object Oriented Programming, Lafore R, Third Edition, Galgotia Publications
6. Problem Solving and Programming in C, R. S. Salaria, Second Edition

Sub code	Subject Name	L	T	P	C
MA1103	Mathematics-I	4	0	0	4

Objectives and Expected Outcome:

The syllabus of this course is specially designed for the beginners in computer science with the first exposure to mathematical topics essential to their study of computer science or digital logic. Topics like recursion and recurrence relations will help them in learning the important concepts of C language. The topic Graph Theory has applications in various fields of computer science like switching theory, logical designs, artificial language and computer graphics etc. These topics will help the students to understand various important concepts of the other subjects of the course. Further it will also provide ground for higher studies in these topics.

UNIT-1

SET THEORY AND RELATIONS

Sets- Elements of a set, methods of describing a set, types of sets, Operations on sets--union, intersection and difference of sets, Venn diagrams, statement problems, Associative Laws, Distributive laws, DeMorgan‟s laws, duality, partitioning of a set.

Relation -Basic definition of relation and types of relations, graphs of relations, properties of relations, (domain, range, inverse and composite relations), Matrix representation of a relation.

UNIT-2

ALGEBRA OF LOGIC, MATHEMATICAL INDUCTION

Propositions and Logic operations, truth tables, arguments and validity of arguments, propositions generated by a set, equivalence and implication laws of logic, mathematical system and propositions over a universe, Quantifiers, Principle of Mathematical Induction.

UNIT-3

GRAPH THEORY

Various types of graphs- Simple and multi graphs, directed and undirected graphs, Eulerian and Hamiltonian graphs, Graph connectivity, graph traversals, graph optimizations, graph coloring, Trees, spanning trees

UNIT-4

RECURSION AND RECURRENCE RELATIONS

Recursion, many faces of recursion, recurrence relations, some common recurrence relations, Matrix Operations: Adittion, Subtraction, Multipication and Inverse

References:

Text Books & Reference Books

1. Discrete Mathematical Structure with application to Computer Science, Tremblay J.P. and Manohar R, McGraw Hill , 30th Reprint (2007)

2. Text Book of Mathematics (for XI Class), R D Sharma, Dinesh Publications

3. Applied Discrete Structure of Computer Science, Doerr A & Kenneth L., Paperback Edition, Galgotia Publications Pvt.Ltd. New Delhi

4. Graphics Networks and Algorithms, Swami M.N.S & Thisiraman E., Second Edition, John Wiley & Sons

Sub code	Subject Name	L	T	P	C
BC1104	Information Technology	4	0	0	4

Unit-1

Computer Fundamentals: Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, and classification of computers on the basis of capacity, purpose, and generation.

Number System: Bit, byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions.

Binary Arithmetic: Addition, subtraction and multiplication.

Unit-2

Memory Types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory.

Input and Output Units: Keyboard, Mouse, Monitor (CRT and LCD): Light pen, joystick, Mouse, Touch screen; OCR, OMR, MICR

Overview of storage devices: Floppy disk, hard disk, compact disk, tape. Printers: Impact, non-impact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer.

Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software.

Unit-3

Operating system: Batch, multi-programming, time sharing, network operating system, on-line and real time operating system, Distributed operating system, multi-processor, Multi-tasking.

Graphical OS: Fundamentals of windows, types of windows, anatomy of windows, windows explorer, customizing windows, control panel, taskbar setting, Network Neighborhood.

Personal Productivity Software:

Word processing: Editing features, formatting features, saving, printing, table handling, page settings, spell-checking, macros, mail-merge, equation editors.

Spreadsheet : Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references, replication, sorting, filtering, functions, Charts & **Graphs. Presentation Graphics Software**: Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slide shows.

Unit-4

Computer Network and Communication: Network types, network topologies, network communication devices, physical communication media.

Internet and its Applications: E-mail, TELNET, FTP, World Wide Web, Internet chatting; Intranet, Extranet, Gopher, Mosaic, WAIS.

Security management tools: PC tools, Norton Utilities, Virus, worms, threats, virus detection, prevention and cure utilities, Firewalls, Proxy servers.

References:

Text Books & Reference Books

1. "Computers Today", D. H. Sanders, Fourth Edition, McGraw Hill, 1988.
2. "Fundamentals of Computers", V. Rajaraman, Second Edition, Prentice Hall of India, New Delhi, 1996.
3. "Information Technology", Satish Jain, Paperback Edition, BPB 1999.

4. "Information Technology Inside and Outside", David Cyganski, John A. Orr, Paperback Edition, Pearson Education 2002.

5. “Computer Fundamentals”, B. Ram, Third Edition, Wiley, 1997.
6. "Fundamentals of Information Technology”, Chetan Srivastva, Third edition, Kalayani Publishers
7. Computers, Larry long & Nancy long, Twelfth edition, Prentice Hall

Sub code	Subject Name	L	T	P	C
BC1105	Workshop On Web Development-I	0	0	4	2

Objectives and Expected Outcome/s: This course will enable the student to build basic understanding of WWW and HTML. The intention is for the student to be able to:

1. Identify the entities responsible for implementing mark-up language standards.
2. Code and troubleshoot HTML web pages.
3. Incorporate multimedia (images, animation, sound, and movies) into web pages.

Internet and its Applications: Concepts of Internet, URL, WWW, Browser, LAN, WAN, MAN, services on Internet, Internet chatting, E-mail, Web Browsing.

Introduction to Web Development:

Website, Webpage, Static Website, Dynamic Website.

Introduction to HTML:

HTML Basics, HTML Elements (Tags), Structure of HTML Program, Attributes, Headings, Paragraphs, Formatting, Links, Images, Tables, Lists, Forms, Frames, Where to put Tables, Lists, Images, Forms.

References:

Text Books & Reference Books

1. HTML & CSS: The Complete Reference, Thomas Powell, Fifth Edition
2. Sams Teach Yourself HTML and CSS in 24 Hours Julie C. Meloni & Michael Morrison, Eighth Edition
3. HTML A Beginner's Guide Wendy L. Willard, Fourth Edition
4. HTML, XHTML and CSS All-In-One For Dummies Andy Harris, Second Edition

Websites:

1. www.w3schools.com
2. www.html.net
3. www.thesitewizard.com

Sub code	Subject Name	L	T	P	C
BC1106	Software Lab-I (Programming in C)	0	0	4	2

Objective and Expected Outcome:

The objective of this course is to help the students in finding solutions to various real life problems and converting the solutions into computer program using C language (structured programming). Students will learn to write programs for solving various real-life problems.

1**. Keywords and Identifiers**: introduction, purpose

2. **Variables and constants**: data types, Initialization, declaration, scope, memory limits

3. **Input-output statements**: formatted and non-formatted statement s

4. **Operators:Arithmetic**, logical,conditional, assignment, bitwise, increment/decrement operators

5. **Decision Making**: switch, if-else, nested if, else-if ladder, break, continue, goto 6. Loops: while, do-while, for

6**. Functions**: definition, declaration, variable scope, parameterized functions, return statement, call by value, call by reference, recursive functions

7. **Pre-processor Directives**: Pre-processor directives like INCLUDE, IFDEF, DEFINE, etc

8. **Header Files**: STDIO.H, MATH.H, STRING.H, PROCESS.H etc

10. **Arrays**: Array declarations, Single and multi-dimensional, memory limits, strings and string functions

11. **Pointers**: Pointer declarations, pointer to function, pointer to array/string, 12.Files: Creation and editing of various types of files, closing a file(using functions and without functions)

Sub code	Subject Name	L	T	P	C
BC1107	Software Lab-II (Information Technology)	0	0	4	2

1. Familiarizing with PC and WINDOWS commands,

2. File creation,

3. Editing

4. Directory creation.

5. Mastery of DOS internal & external commands.

6. Learning to use MS Office: MS WORD, MS EXCEL & MS PowerPoint.

Sub code	Subject Name	L	T	P	C
FS1108	Finishing School- I	1	-	2	2

1. **Unit I - Self Analysis (4 Hours)**
SWOT Analysis, Self Introduction, Who am I, My attributes, Importance of Self Confidence, Self Esteem

2. **Unit II - Attitude (4 Hours)**
Factors influencing Attitude, Challenges and lessons from Attitude, Change Management
Exploring Challenges, Risking Comfort Zone, Managing Change

3. **Unit III - Motivation (6 Hours)**
Factors of motivation, Self talk, Intrinsic & Extrinsic Motivators.

4. **One Minute Talk**

5. **Group Discussion**

6. **Value based role plays**

7. **News Sharing and news interpretation**

BCA 2nd Semester Syllabus

BCA 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC 1201	System Analysis & Design	4	0	0	4

Objective/s & Expected Outcome: To teach the analysis and practicality of various systems on which software system can be developed. After completing this course students will be able to design and develop systems.

Unit-1

System Development Life Cycle: System Definition, characteristics, elements & types of system, Phases of SDLC, Information gathering tools, Structured Analysis tools, Role of System Analyst.

Unit-2

System Design: Process and stages of systems design, Input / Output and file design, Documentation (User Manual, Design Documentation, Training Manual), Case Study techniques in system design.

Unit-3

System testing: Unit Testing, System Testing, Integration Testing, Alpha & Beta Testing, Acceptance Testing, Regression Testing.

Unit-4

System Implementation: System implementation Process, Implementation methods, System maintenance, Post implementation maintenance.

References:

Text Books & Reference Books

1. System Analysis and Design Awad Elias N. Second Edition, Galgotia Publications
2. Analysis and Design of Information System Sen James A. Second Edition, Tata McGraw Hill.

Sub code	Subject Name	L	T	P	C
FS 1202	Communication-II	4	0	0	4

Objective & Expected Outcome: The objective of this course is to make students understand the value of business communication, written & presentation skills in professional life. The students should be well equipped with business & written communication with effective presentation skills.

Unit-1

Introduction to Business Communication

Meaning and Definition; process and classification of communication; elements & characteristics of communication; barriers to effective communication in business organization; Formal and Informal communication; grapevine, importance of effective communication in business house; Principals of effective communication

Unit-2

Writing Skills

Inter-office memorandums; faxes; E-mails; writing effective sales letters - to agents; suppliers; customers; report writing; project writing.

Unit-3

Curriculum Vitae (CV)

Drafting a CV; writing job application and other applications; do‟s and don‟ts while appearing for an Interview; types of interview.

Unit-4

Presentation Skills

Introduction; need of good presentation skills in professional life; preparing a good presentations; group discussion; extempore speaking.

References:

Text Books & Reference Books

1. Effective Business Communication - M.V. RODRIGUEZ

2. Business Communication -Meenakshi Raman, Parkash Singh, Paperback Edition, Oxford University Press

Sub code	Subject Name	L	T	P	C
MA 1203	Mathematics-II	5	0	0	5

Objectives & Expected Outcome: This syllabus is specially designed to help the students of computer science to understand the mathematical concepts like matrices, differential calculus and integral calculus which have applications in various subjects of computer science. Also Statistics has been added to help them understand the topics like central tendency, deviations, and moments etc which are very useful in day to day life. After learning these topics, students will be able to apply these concepts in designing the software applications for some specific devices.

Unit-1

MATRIX ALGEBRA

Matrix algebra- Matrices, types of matrices, operations on matrices, determinants (without properties), minors, cofactors, adjoint and inverse of a matrix, Elementary transformations in a matrix Rank of a matrix, solution of simultaneous equations using Crammer‟s rule and matrix inversion method.

Unit-2

STATISTICS & APPLICATIONS OF LOGARITHMS

Statistics- Introduction to statistics, measures of central tendency - mean, median and mode, measures of dispersion, mean deviation, standard deviation and coefficient of variation.

Applications of Logarithms- Problems related to compound interest, depreciation and Annuities.

Unit-3

DIFFERENTIAL CALCULUS

Introduction to differentiation, derivative of a function of one variable, power functions, sum and product of two functions, function of a function, differentiation by method of substitution, maxima and minima.

Unit-4

INTEGRAL CALCULUS

Indefinite Integral, Integration by substitution, Integration by parts, Integration by partial fractions, Definite Integral. Numerical Integration: Trapezoidal rule, Simpson‟s 1/3 rule, Simpson‟s 3/8 rule.

References:

Text Books & Reference Books

1. Numerical Methods to Engineering., B.S.Grewal, Seventh Edition, Khanna Publishers

2. Business Mathematics, D.C.Sancheti, Eleventh Edition, Sultan Chand & Sons

3. Computer Oriented Numerical Methods, Rajaraman, Third Edition, PHI Publications

Sub code	Subject Name	L	T	P	C
BC 1204	OOPS Using C ++	4	0	0	4

Objective & Expected Outcome: The objective of this course to learn programming from real world examples and understanding object oriented approach for finding solutions to various problems with the help of C++ language. Students will learn to create computer based solutions to various real-world problems using C++ and will learn various concepts of object oriented approach towards problem solving.

Unit-1

Introduction: Object oriented programming approach, characteristics of object orientated languages, Bridging C & C++ (Overview of C Concepts).

Structures and Unions: Declaration of structures, Accessing structure members, Structure Initialization, Arrays of structure, nested structures, structure with pointers, functions & structures, Unions, Structure/Union Versus Class in C++.

Class Declaration: Data Members, Member Functions, Private and Public Members, Data Hiding and Encapsulation, Array within a class.

Unit-2

Class Function Definition: Member Function definition inside the class and outside the class, Friend Function, Inline Function, Static Members & Functions, Scope Resolution Operator, Private and Public Member Functions, Nesting of Member Functions. Creating Objects, Accessing class data members, Accessing member functions, Arrays of Objects, Objects as function arguments: Pass by value, Pass by reference, Pointers to Objects.

Constructors and Destructors: Declaration and Definition, Default Constructors, Parameterized Constructors, Constructor Overloading, Copy Constructors. Destructors: Definition and use.

Unit-3

Inheritance - Extending Classes Concept of inheritance, Base class, Derived class, Defining derived classes, Visibility modes : Private, public, protected; Single inheritance : Privately derived, Publicly derived; Making a protected member inheritable, Access Control to private and protected members by member functions of a derived class, Multilevel inheritance, Nesting of classes.

Function Overloading & Operator Overloading: Binary & Unary.

Unit-4

Polymorphism: Definition, early Binding, Polymorphism with pointers, Virtual Functions, late binding, pure virtual functions.

Input/output files: Streams, buffers & iostreams, header files, redirection, file input and output.

References:

Text Books & Reference Books:

1. Object Oriented Programming with C++, E. Balagurusami, Fourth Edition, Tata Mc-Graw Hill
2. Object Oriented Programming in Turbo C++, Robert Lafore, Fourth Edition Galgotia Publications.
3. The C++ Programming Language, Bjarna Stroustrup, Third Edition, Addison-Wesley Publishing Company.
4. Object Oriented Programming Using C++, Salaria, R. S, Fourth Edition, Khanna Book Publishing

Sub code	Subject Name	L	T	P	C
BC 1205	Computer System Architecture	4	0	0	4

Objectives and Expected Outcome: To make students aware about the basic building blocks of computer system and how the different components are interfaced together. Students will know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system.

Unit-1

Introduction to Computer Organization: Introduction to Computer and CPU (Computer Organization, Computer Design and Computer Architecture), Stored Program Concept- Von Neumann Architecture. Introduction to Flynn‟s Classification-SISD, SIMD, MIMD

Register Transfer and Micro operations- Introduction to Registers, Register Transfer Language, Data movement among Registers and Memory.

Micro operations: Introduction to micro operations, Types of micro operations--Logic Operations, Shift operations, Arithmetic and Shift operations.

Common Bus System: Introduction to Common Bus System, Types of Buses(Data Bus, Control Bus, Address Bus), 16 bit Common Bus System--Data Movement among registers using Bus.

Unit-2

Basic Computer Instructions- Introduction to Instruction, Types of Instructions (Memory Reference, I/O Reference and Register Reference), Instruction Cycle, Instruction Formats (Direct and Indirect Address Instructions, Zero Address, One Address, Two Address and Three Address Instructions)

Interrupt: Introduction to Interrupt and Interrupt Cycle.

Design of Control Unit: Introduction to Control Unit, Types of Control Unit (Hardwired & Micro programmed Control Unit).

Addressing Modes-Introduction & different types of Addressing Modes.

Unit-3

I/O Organization: I/O Interface Unit, types of ports (I/O port, Network Port, USB port, Serial and Parallel Port), Concept of I/O bus, Isolated I/O versus Memory Mapped I/O. I/O Data Transfer Techniques: Programmed I/O, Interrupt Initiated I/O, DMA Controller and IOP.

Synchronous and Asynchronous Data Transfer: Concept of strobe and handshaking, source and destination initiated data transfer.

Unit-4

Stack Organization: Memory Stack and Register Stack

Memory organization: Memory Hierarchy, Main Memory (RAM and ROM chips, Logical and Physical Addresses, Memory Address Map, Memory Connection to CPU), Associative Memory

Cache Memory: Cache Memory (Initialization of Cache Memory, Writing data into Cache, Locality of Reference, Hit Ratio), Replacement Algorithms (LRU and FIFO).

Cache Memory Mapping Techniques: Direct Mapping, Associative Mapping and Set-Associative Mapping. Harvard Architecture, Mobile Devices Architecture (Android, Symbian and Windows Lite), Layered Approach Architecture.

References:

Text Books & Reference Books

1. Computer System Architecture, M.M. Mano, Third Edition, PHI
2. Computer Organization and Architecture, J.P. Hayes, Third Edition, TMH 3. Computer Organization and Architecture, Stallings, Eighth Edition, PHI

Sub code	Subject Name	L	T	P	C
BC 1206	Workshop On Web Development-II	0	0	4	2

Objectives and Expected Outcome/s: This course will enable the student to build and publish web sites using Dreamweaver, Photoshop and CorelDraw popular visual web site production and management programs, using HTML, DHTML, CSS and JavaScript. The intention is for the student to be able to:

1. Identify the entities responsible for implementing mark-up language standards.
2. Code and troubleshoot HTML and XHTML web pages, incorporating CSS and scripts.
3. Incorporate multimedia (images, animation, sound, and movies) into web pages.
4. Demonstrate effective use of Dreamweaver to build and publish professional web sites that employ best practices, adhere to current web standards, and pass validation.

DHTML Introduction

CSS in DHTML, Implementation of WebPages using C

Introduction to scripting language:

Client Side Scripting ,Server Side Scripting, JavaScript introduction ,How & Where to put the JavaScript Code, JavaScript Statements, Comments,
Variables, Operators, Control Statements, Loops, Popup Boxes, Functions.

Introduction to Dreamweaver, Photoshop and CorelDraw:

Understanding Workspace Layout, Managing Websites, Creating a Website, Using Dreamweaver Templates, Adding New WebPages, Text and Page Format, Inserting Tables, Lists, Images, Adding Links. Introduction of Photoshop and CorelDraw

References:

Text Books & Reference Books

1. HTML & CSS: The Complete Reference, Thomas Powell, Fifth Edition
2. Sams Teach Yourself HTML and CSS in 24 Hours Julie C. Meloni & Michael Morrison, Eighth Edition
3. HTML, XHTML and CSS All-In-One For Dummies Andy Harris, Second Edition
4.. JavaScript, A Beginner's Guide John Pollock, Third Edition
5.. Professional JavaScript for Web Developers (Wrox Programmer) Nicholas C. Zakas, Second Edition
6. Dreamweaver CS5 For Dummies Janine C. Warner, Paperback Edition
7.. Adobe Dreamweaver CS5 Bible Joseph Lowery, Paperback Edition
8. The Essential Guide to Dreamweaver CS4 David Powers

Websites:

1. www.w3schools.com
2. www.html.net
3. www.thesitewizard.com
4. www.learndreamweavertutorials.com

Sub code	Subject Name	L	T	P	C
BC1207	Software Lab-III (OOPS Using C++)	0	0	4	2

Instructions for candidates: All the following concepts need to be practised with at least 10 programs per topic and sub-topic along with their algorithms. Practical file needs to be maintained.

Structures: Definition, declaration, scope, functions
Union: Definition, declaration, scope, functions
Class: Definition, declaration, members, scope of members.

Class Function: definition (Inside class, outside class), in-line functions, static function, friend functions, scope of functions (public, private), and nesting of member functions
Class Data members: creating objects, accessing member functions, array of objects, objects as arguments (Pass by value, pass by reference)
Constructor and destructor: creating default constructor, parameterized constructor, copy constructor, destructor

Inheritance: base class, derived class, visibility mode (public, private, protected),single inheritance, multi-level inheritance, multiple inheritance, nesting of classes, access control to functions(with different scope),
Function overloading and overriding, operator overloading, Early binding, late binding, virtual functions, pure virtual functions

Input/output files: streams, buffers and io-streams, various input-output functions, processing files using class functions

Sub code	Subject Name	L	T	P	C
FS1208	Finishing School -II	1	-	2	2

1. **Unit I - Goal Setting (6 Hours)**

Wish List, SMART Goals, Blue print for success, Short Term, Long Term, Life Time Goals. Time Management, Value of time, Diagnosing Time Management, Weekly Planner To do list, Prioritizing work.

2. **Unit II - Creativity (10 Hours)**

Out of box thinking, Lateral Thinking

3. **Unit III– Presentation (1 Hour per Student)**
4. **One Minute Talk**
5. **Group Discussion**
6. **Value based role plays**
7. **News Sharing and news interpretation**

BCA 3rd Semester Syllabus

BCA 3 Semester Syllabus

Sub code	Subject Name	L	T	P	C

BC2301 Software Engineering 4 0 0 4

Unit-1

Software: Characteristics, Components, Applications, And Software Process Models: Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics & Measurements

Unit-2

S/W Project Planning: Objectives, Decomposition Techniques: S/W Sizing, Problem Based Estimation, Process Based Estimation, Cost Estimation Models: COCOMO Model, The S/W Equation,

Unit- 3

System Analysis: Principles Of Structured Analysis, Requirement Analysis, DFD, Entity Relationship Diagram, Data Dictionary.

S/W Design: Objectives, Principles, Concepts, Design methodologies: Data design, Architectural design, procedural design, Object -oriented concepts

Unit- 4

Testing fundamentals: Objectives, principles, Testability, Test cases: White box & Black box testing, Testing strategies: verification & validation, unit test, integration testing, validation testing, system testing.

Recommended Books:

1. Roger S. Pressman, "Software Engineering – A Practitioner's Approach ", Sixth Edition, McGraw Hill
2. R.E. Fairley, "Software Engineering Concepts", Paperback Edition, McGraw Hill.
3. Jalota, "An Integrated Approach to Software Engineering", Third Edition, Narosa Publishing House
4. Fundamentals of Software Engineering, Rajib Mall, PHI, New Delhi.
5. An Integrated Approach to Software Engineering by Pankaj Jalote, Narosa Publications, New Delhi

Sub code	Subject Name	L	T	P	C
BC2302	Digital Electronics	3	1	0	4

Unit-1

Number System: Decimal Number System, Binary Number System, Octal Number System, Hexa-decimal Number System, Conversion from One Number System to another, Arithmetic Operation without Changing the Base, 1"s Complement and 2"s Complement. **Logic Gates:** AND, OR, NOT, NAND, NOR, XOR, XNOR, NAND & NOR as Universal Gates, Logic Gates Applications

Unit-2

Boolean Algebra: Introduction, Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP & POS Forms, Realization of Boolean Expression using Gates, K-Maps, Simplification of Boolean Expression using K-Maps

Unit-3

Combinational Logic Circuits: Half Adder & Half Subtractor, Full Adder & Full Subtractor, Parallel Binary Adder, Binary Adder/Subtractor. Multiplexers & Demultiplexers, Implementation of Boolean equations using Multiplexer and Demultiplexer, Encoders & Decoders

Unit-4

Sequential Logic Circuits: Latch, Flip Flops- R-S Flip-Flop, J-K Flip-Flop, Master-Slave J-K Flip-Flop, Race Condition, Removing Race Condition, D Flip-Flop, T Flip-Flop, Applications of Flip-Flops.

Recommended Books:

1. Modern Digital Electronics- R. P. Jain, Tata McGraw Hill Pub. Company
2. Digital Fundamentals-Thomas L. Floyd, Universal Publishing House
3. Digital Electronics: An Introduction to Theory and Practice-William H. Gothmann, Prentice Hall of India
4. Digital Principles and Applications, A.P. Malvino, McGraw Hill International Editions.

Sub code	Subject Name	L	T	P	C
BC2303	Operating Systems	3	1	0	4

Unit-1

Introduction to operating system, its need and operating system services; operating system classification – single user, multi user, simple batch processing, Multiprogramming, Multitasking, parallel Systems, Distributed system, Real time system. **Process Management**: Process concept, Process scheduling, threads, overview of Inter process communication,

Unit-2

CPU scheduling: Basic concepts, Scheduling Criteria, Scheduling algorithms.

Deadlock: Deadlock characteristics, Prevention, Avoidance, Detection and Recovery, critical section, synchronization hardware, semaphores, combined approach to deadlock handling

Unit-3

Memory management: Logical versus Physical address space, Swapping, Partition, Paging and segmentation.
Virtual memory: Demand paging, Page replacement algorithms, Allocation algorithms, Thrashing.
Unit-4

File Management: File concept, access methods, and Directory structure – single level, two lever, tree structures, acrylic graph and general graph directory, file protection. Allocation methods: Contiguous, linked and index allocation, free space management
Device management: Disk structure, disk scheduling, FCFS scheduling, SSTF scheduling, SCAN scheduling, C-SCAN scheduling, Selecting Disk Scheduling Algorithms

Recommended Books:

1. Operating System Principles by Abraham Silberschatz and Peter Baer Galvin, Seventh Edition, Published by Wiley-India
2. Operating Systems by Sibsankar Haldar and Alex A. Aravind, Published by Pearson Education.
3. An Introduction to Operating Systems By Dietel H.M., Second Edition, Published by Addison Wesley.
4. Operating system by Milan Milenkovic, Second Edition
5. Operating system by Stalling, W., Sixth Edition, Published by Prentice Hall (India)

Sub code	Subject Name	L	T	P	C
BC2304	Workshop on PC-H/w	2	0	4	4

Unit-1

Fundamental of Computer: Block diagram and brief introduction of each block. Types of computers, specifications of latest desktops and laptops, Microprocessor, Memory, Motherboard, UPS, Power Supply, Cooling and Protection.

Unit-2

Disk Drives - Floppy & Hard Disk, CD & DVD ROMs and Writers, I/O Ports and Serial, Parallel and USB Interface, Keyboard and Mouse, printers and printing mechanism, How printer works, Trouble shooting printers.

Unit-3

Desktop Operating System: OS Basics, Install, Configure, Manage Windows, Installing device drivers.

Unit-4

Familiarization with Networking Components and devices: LAN Adapters, Hubs, Switches, Routers etc.
Familiarization with Transmission media and Tools: Co-axial cable, UTP Cable, Crimping Tool, Connectors etc

Recommended Books:

1. Hardware Bible By : Winn L Rosch, Techmedia publications
2. Trouble shooting, maintaining and repairing PCs By : Stephon J Bigelow Tata McGraw Hill Publication
3. Modern All about printers By : Manohar Lotia, Pradeep Nair, Bijal Lotia BPB publications.

Websites:
1. www.w3schools.com
2. www.html.net
3. www.thesitewizard.com
4. www.learndreamweavertutorials.com

Sub code	Subject Name	L	T	P	C
BC2305	Workshop on PHP	2	0	4	4

Unit-1

Introduction to PHP : - Introduction to www, History, Understanding client/server roles
Apache, PHP, MySQL, XAMPP Installation

PHP Fundamentals: PHP Basic syntax, PHP data Types, PHP Variables, PHP Constants, PHP Expressions, PHP Operators, PHP Control Structures, PHP Loops

Unit-2

PHP Arrays: PHP Enumerated Arrays, PHP Associative Arrays Array Iteration, PHP Multi-Dimensional Arrays, Array Functions

PHP Functions: PHP Functions, Syntax, Arguments, Variables, References, Pass by Value & Pass by references, Return Values, Variable Scope, PHP include(), PHP require()

Unit-3

PHP Forms: PHP Form handling, PHP GET, PHP POST, PHP Form Validation

Unit-4

PHP Cookies & PHP Sessions: PHP Cookie handling, PHP Session Handling, PHP Login Session, Managing user ACL

Recommended Books:

1. MongoDB and PHP By steve Francia(Author)
2. Web Enabled Commercial Application Development Using HTML, DHTML and PHP by Author: Ivan Bayross.

Subject code	Subject Name	L	T	P	C
BC2306	Hardware Lab-I (Digital Electronics)	0	0	4	2

List if Experiments (Not limiting to)

1. To study the function of basic logic gates and verify the truth table of AND, OR, NOT, X OR, NAND, NOR.
2. To study applications of AND, OR, NAND, X-OR gates for gating digital signals.
3. Half Adder / Full Adder: Realization using basic and XOR gates.
4. Half Subtractor / Full Subtractor: Realization using NAND gates.
5. 4-Bit Binary-to-Gray & Gray-to-Binary Code Converter: Realization using XOR gates.
6. 4-Bit and 8-Bit Comparator: Implementation using IC7485 magnitude comparator chips
7. Multiplexer: Truth-table verification and realization of Half adder and Full adder using IC74153 chip.
8. Demultiplexer: Truth-table verification and realization of Half subtractor and Full subtractor using IC74139 chip.
9. Flip Flops: Truth-table verification of JK Master Slave FF, T-type and D-type FF using IC7476 chip.

Sub code	Subject Name	L	T	P	C
HV2307	Human Values and Professional Ethics	3	0	0	3

Unit- 1

1. **Course Introduction - Need, Basic Guidelines, Content and Process for Value Education**

• Understanding the need, basic guidelines, content and process for Value Education. • Self Exploration–what is it? - Its content and process; „Natural Acceptance‟ and Experiential Validation- as the mechanism for self-exploration.
• Continuous Happiness and Prosperity- A look at basic Human Aspirations
• Right understanding, Relationship and Physical Facilities- the basic requirements for fulfillment of aspirations of every human being with their correct priority
• Understanding Happiness and Prosperity correctly- A critical appraisal of the current scenario
• Method to fulfill the above human aspirations: understanding and living in harmony at various levels

2. **Understanding Harmony in the Human Being - Harmony in Myself!**

• Understanding human being as a co-existence of the sentient „I‟ and the material „Body‟
• Understanding the needs of Self („I‟) and „Body‟ - Sukh and Suvidha
• Understanding the Body as an instrument of „I‟ (I being the doer, seer and enjoyer) • Understanding the characteristics and activities of „I‟ and harmony in „I‟
• Understanding the harmony of I with the Body: Sanyam and Swasthya; correct appraisal of Physical needs, meaning of Prosperity in detail
• Programs to ensure Sanyam and Swasthya

3. **Understanding Harmony in the Family and Society- Harmony in Human-Human Relationship**

• Understanding harmony in the Family- the basic unit of human interaction.
• Understanding values in human-human relationship; meaning of Nyaya and program for its fulfillment to ensure Ubhay-tripti; Trust (Vishwas) and Respect (Samman) as the foundational values of relationship.
• Understanding the meaning of Vishwas; Difference between intention and competence
• Understanding the meaning of Samman, Difference between respect and differentiation; the other salient values in relationship
• Understanding the harmony in the society (society being an extension of family): Samadhan, Samridhi, Abhay, Sah-astitva as comprehensive Human Goals
• Visualizing a universal harmonious order in society- Undivided Society (Akhand Samaj), Universal Order (Sarvabhaum Vyawastha)- from family to world family!

Unit-2

4**. Understanding Harmony in the Nature and Existence - Whole existence as Co-existence**

• Understanding the harmony in the Nature
• Interconnectedness and mutual fulfillment among the four orders of nature-recyclability and self- regulation in nature
• Understanding Existence as Co-existence (Sah-astitva) of mutually interacting units in all- pervasive space
• Holistic perception of harmony at all levels of existence

5. **Implications of the above Holistic Understanding of Harmony on Professional Ethics**

• Natural acceptance of human values
• Definitiveness of Ethical Human Conduct
• Basis for Humanistic Education, Humanistic Constitution and Humanistic Universal Order
• Competence in professional ethics:
o Ability to utilize the professional competence for augmenting universal human order
o Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems
o Ability to identify and develop appropriate technologies and management patterns for above production systems.

Recommended Books:

1. R R Gaur, R Sangal, G P Bagaria, 2009, A Foundation Course in Value Education.

2. B L Bajpai, 2004, Indian Ethos and Modern Management, New Royal Book Co., Lucknow. Reprinted 2008.

3. A Nagraj, 1998, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.

4. PL Dhar, RR Gaur, 1990, Science and Humanism, Commonwealth Publishers.

5. A.N. Tripathy, 2003, Human Values, New Age International Publishers.

Sub code	Subject Name	L	T	P	C
FS2308	Finishing School -III	1	-	2	2

Unit I – Numbers (6 Hours)
Types and Properties of Numbers, LCM, GCD, Fractions and decimals, Surds

Unit II- Arithmetic – I (6 Hours)

Percentages, Profit & Loss, Simple Interest & Compound Interest, Clocks & calendars

Unit III - Algebra - I (6 Hours)
Logarithms, Problems on ages

Unit IV - Modern Mathematics - I (6 Hours)
Permutations, Combinations, Probability

Unit V - Reasoning (6 Hours)
Logical Reasoning, Analytical Reasoning

ASSESSMENT
Objective type – Paper based / Online – Time based test 50 marks

BCA 4th Semester Syllabus

BCA 4 Semester Syllabus

Subject code	Subject Name	L	T	P	C
BC2401	Data Structures-I	4	1	0	5

Unit-1

Introduction to Data Structures: Basic concept of data, Problem analysis, algorithm complexity, Big O notation and time space trade off,

Types of data structures: arrays records, pointers, stack, queue, trees, linked list packet, blocks, tracks, sector(in storage devices).

Unit-2

Arrays: Types of arrays, Operations on Arrays Creation, Insertion, Deletion,

Searching and Sorting: Introduction to use of various data structures for searching and sorting

Unit-3

Link List: Representation of linked list, Linked list operations, Circular Linked List, Multi linked structures, Memory Representation: Fixed Block Storage and Variable Block Storage, Applications of Linked List

Unit-4

Stacks & Queues: Memory Representation of Stacks via arrays and Linked List, Operations on Stack: Push, pop, Application of stack: Infix to postfix and prefix forms for expressions, Evaluation of postfix expressions, Queues, priority Queues

Recommended Books:

1. Seymour Lischutz, Data Structures, McGraw-Hill Book Company, Schaum's Outline Series, New York.
2. Trembley, J.P. and Sorenson P.G. An Introduction to Data Structures with Applications, McGraw-Hill International Student Edition, New York.
3. Yedidyah Langsam, Moshe J Augernstein and Aarson M.Tanenbaum, Data Structures using C and C ++, PHI, New Delhi.

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2402	Database Management Systems	3	1	0	4

Unit-1

An overview of DBMS: Concept of File Processing Systems and database systems, Database Administrator and his responsibilities, Physical and Logical data independence.

Three level Architecture of Database System: The external level, conceptual level and the internal level.

Unit-2

Introduction to Data Models: Entity Relationship Model, Hierarchical, Network and Relational Model. Comparison of Network, Hierarchical and Relational Model.

Unit-3

Relational data Model: Relational database, relational algebra and calculus, SQL ependencies, functional dependency, multi-valued dependency and join, normalization

Unit-4

Transaction Management and Concurrency control: Transaction Management, Locking ,Timestamping.
Distributed databases: Structure of a distributed database, design of distributed databases.

Recommended Books:

1. Fundamentals of Database Systems by R.Elmasri and S.B.Navathe, 3rd Edition, Pearson Education, New Delhi.
2. An Introduction to Database Systems by C.J. Date, 7th Edition, Pearson Education, New Delhi.
3. A Guide to the SQL Standard, Data, C. and Darwen, H.3rd Edition, Reading, Addison-Wesley Publications, New Delhi.

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2403	Workshop on Visual Basic	2	0	4	4

Unit-1

Introduction to Visual Basic :The Visual Basic Program Development Process; The Visual Basic Environment; Opening a Visual Basic Project; Saving a Visual Basic Project; Running a Visual Basic Project.

Visual Basic Fundamentals: Constants; Variables; Data Types and Data Declarations; Operators and Expressions; String Expressions; Library functions , Branching and Looping Statements, Branching with the if-Then Block; Branching with if-Then -Else Blocks; Selection: Select-case; Looping with for-Next; Looping With Do-Loop; Looping with While-Wend

Unit-2

Visual Basic Control Fundamentals: Visual Basic Control Tools; Control tool Categories; Working with controls; Naming Forms and Controls; Assigning Property Values to Forms and Controls; Executing Commands(Event Procedures and Command Buttons).

Display Output Data (Labels and Text Boxes): Entering Input data(Text Boxes); selecting Multiple Features(Check Boxes); selecting Exclusive Alternatives (Option Button and Frames). Assigning Properties Collectively (The With Block); Generating Error Messages (The MsgBox Function); Creating Times Events; Scrollbars

Unit-3

Menus and Dialog Boxes Building Drop-down Menus; accessing a Menu from the Keyboard; Menu Enhancements; Submenus; Pop-up Menus; Dialog Boxes; Input Box.

Executing and Debugging a New Project : Syntax Errors; Logical Errors; Setting break Points; Defining Watch Values; Stepping Through a Program; User- Induced Errors; Error Handlers.

Unit-4

Procedures: Modules and Procedures; Sub Procedure; Event Procedures; Function. Arrays: Array Characteristics; Array declarations; Processing Array Elements; Passing Arrays to Procedures; Dynamic Arrays; Array-Related Functions; Control Arrays.

Working With Database : Data Control ,Studying the Properties and methods of Data Control Connectivity with MS-Access , Operations of database through coding

Recommended Books:

1. Visual Basic 6 from the Ground Up, Gary Cornell, Paperback Edition, TMH.
2. Essentials of Visual Basic 6.0 Programming, David I. Schneider, First Edition, Prentice Hall
3. Visual Basic 6: The Complete Reference, Noel Jerke, First Edition, TMH

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2404	Software Lab -IV(Data Structures-I)	0	0	4	2

List of Programs (not limiting to):

1. Traversing the elements of an Array
2. Inserting an element in an Array
3. Deleting an element from an Array
4. Merging of two Arrays
5. Linear Search
6. Binary Search
7. Insertion Sort
8. Bubble Sort
9. Selection Sort
10. Program using Recursion
11. Implementing PUSH & POP operations of a Stack
12. Array Implementation of a Queue and Circular Queue
13. Converting infix notation into post fix notation
14. Insertion in single and double Linked List
15. Deletion from single and double Linked List

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2405	Software Lab-V (Database Management Systems)	0	0	4	2

List of the Programs (not limiting to):

- **Creating Database**
  - Creating a Database
  - Creating a Table
  - Specifying Relational Data Types
- **Table and Record Handling**
  - INSERT statement
  - Using SELECT and INSERT statement
  - DELETE, UPDATE statements
  - DROP, ALTER statements
- **Retrieving Data from a Database**
  - The SELECT statement
  - Using the WHERE clause
- Using Logical Operators in the WHERE clause Using IN, BETWEEN, LIKE , ORDER BY.

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
EV2406	Environment Science	3	0	0	3

Unit- I

Introduction To Environmental Sciences: Natural Resources: Environmental Sciences, Relevance, Significance, Public awareness, Forest resources, Water resources, Mineral resources, Food resources, conflicts over resource sharing, Exploitation, Land use pattern, Environmental impact ,fertilizer, Pesticide Problems, case studies

Unit-II

Environmental Pollution And Management: Environmental Pollution-Causes, Effects and control measures of Air, Water, Marine, soil, solid waste. Disaster Management-Floods, Earth quake, Cyclone and Land slides. Role of individuals in prevention of pollution- pollution case studies

Unit-III

Human Population and the Environment- Population growth, variation among nations. Population explosion – Family Welfare Program. Environment and human health, Human Rights, Value Education, HIV / AIDS, Women and Child Welfare, Role of Information Technology in Environment and human health, Case Studies.

Unit-IV

Concept and Significance of Road Safety, Role of Traffic Police in Road Safety, Traffic Engineering – Concept & Significance, Traffic Rules & Traffic Signs, How to obtain Driving License, Traffic Offences, Penalties and Procedures, Common Driving mistakes, Significance of First-aid in Road Safety, Role of Civil Society in Road Safety, Traffic Police-Public Relationship.

Recommended Books:

1. Dr. G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publications
2. Dara S S, A text book of environmental chemistry and pollution control, S.C & Company.
3. Haynes, R Environmental Science Methods, Chapman & Hall, London.
4. Shailendra K Singh, Subash C.Kundu , Disaster Management,Mittal Publications.
5. Elvik Rune, The Handbook of Road Safety Measures Hardcover, Emerald Group Publishing Ltd.
6. The Motor Vehicle Act, 1988 (2010), Universal Law Publishing Co. Pvt. Ltd., New Delhi.
7. Road Safety Signage and Signs (2011), Ministry of Road Transport and Highways, Government of India.

Websites:

(a) www.chandigarhpolice.nic.in
(b) www.punjabpolice.gov.in
(c) www.haryanapolice.gov.in
(d) www.hppolice.nic.in

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
FS2407	Finishing School- IV	1	-	2	2

Unit I (6 hours)
Critical Reasoning – Essay Writing

Unit II (6 hours)
Synonyms – Antonyms - Odd Word - Idioms & Phrases

Unit III (6 hours)
Word Analogy - Sentence Completion

Unit IV (6 hours)
Spotting Errors - Error Correction - Sentence Correction

Unit V (6 hours)
Sentence Anagram - Paragraph Anagram - Reading Comprehension

ASSESSMENT

Objective type – Paper based /Online – Time based test 50 marks

BCA 5th Semester Syllabus

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3501	Advanced database Systems	**3**	**1**	**0**	**4**

Unit-1

Degree Of Data Abstraction, The Database Life Cycle (DBLC): Initial Study Of The Database, Database Design, Implementation And Loading, Testing And Evaluation, Operation, Maintain Ace And Evaluation.

Unit-2

Centralized Verses Decentralized Design, What Is A Transaction? Concurrency Control
(Locking Methods, Time Stamping Method, Optimistic Method)
Distributed Database Management Systems (DDBMS) :Advantage And Disadvantages. Homogeneous And Heterogeneous DBMS, Distributed Database Transparency Features. Level Of Data And Process Distribution: SPSD (Single–Site Processing, Single-Site Data), MPSD (Multiple-Site Processing, Single Site Data), MPMD (Multiple –Site Processing, Multiple-Site Data)

Unit-3

Systems, Client / Server: Architecture And Implementation Issues.
Client / Server Systems, What Is Client / Server? The Forces That Drive Client /Server

Unit-4

(DSS) Decision Support Systems: Operational Data Vs. Decision Support Data, The DSS ,Database Requirements.
The Data Warehouse: The Evaluation Of The Data Warehouse, Rules for Data Warehouse. Online Analytical Processing (OLAP): OLAP Architecture Relational, OLAP And Comparison, Data Mining.

Recommended Books:

1. An Introduction To Database Systems (Sixth Edition) By C.J.Date
2. Data Base Systems (3rdEdition) Galgotia Publications (P) Ltd. By Peter Rob Carlos Coronel
3. An Introduction To Database Systems By Bipin C. Desai
4. Henry F. Korth, "Database System Concepts", McGraw Hill.
5. Naveen Prakash, "Introduction to Database Management", TMH

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3502	Data Structures-II	3	1	0	4

Unit-1

Sorting And Searching Techniques: Bubble, Selection, Insertion, Shell sorts and Sequential, Binary, Indexed Sequential Searches, Interpolation, Binary Search Tree Sort, Heap sort, Radix sort Analysis of Algorithms Algorithm, Pseudo code for expressing algorithms, time complexity and space complexity, O-notation, Omega notation and theta notation.

Unit-2

Recursion: Introduction, Direct and Indirect Recursion, Tail Recursion, Efficiency of Recursion

Unit-3

Trees: Definition and basic concepts, linked representation and representation in contiguous storage, binary tree, binary tree traversal, searching, insertion and deletion in binary tree

Unit-4

Graph:Representation of Graphs, Traversals in Graphs, Applications of Graphs – Shortest Path Problem, Minimum Spanning Trees

Recommended Books:

1. Seymour Lischutz, Data Structures, McGraw-Hill Book Company, Schaum's Outline Series, New York.
2. Trembley, J.P. and Sorenson P.G. An Introduction to Data Structures with Applications, McGraw-Hill International Student Edition, New York.
3. Yedidyah Langsam, Moshe J Augernstein and Aarson M.Tanenbaum, Data Structures using C and C ++, PHI, New Delhi.

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3503	Core Java	4	0	0	4

Unit-1

Java Evolution: - Java History; Java Features, How Java Differs from C and C++; Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements; Java Support Systems, Java Environment.

Overview Of Java Language: - Introduction; Simple Java Program , More of Java, An application with Two Classes, Java Program Structure , Java Tokens , Java Statements; Implementing a Java Program, Java Virtual Machine; Command Line Arguments; Programming Style.

Constants, Variables And Data Types: - Introduction, Constants, Variables; Data Types, Symbolic Constants, Type Casting, Getting Values of Variables; Values.

Unit- 2

Operators And Expressions: - Introduction to Operators ,

Decision Making And Branching: - Introduction; Simple if Statement; the if…..else Statement; Nesting of if…..else Statements; The else if Ladder; The switch statement; the**? :** Operator.

Looping: - Introduction; The while Statement; The do Statement; the for Statement;

Classes, Objects And Methods: - Introduction; Defining a Class; Adding Variables; Adding Variables; Adding Methods; Creating Objects; Constructors; Methods Overloading; Nesting of Methods;

Inheritance: Extending a Class, Overriding Methods; Final Variables and Methods; Final Classes; Finalizer Methods; Abstract Methods.

Unit-3

Arrays, Strings And Vectors: - Arrays; One-Dimensional Arrays; Creating an Array, Two-Dimensional Arrays, Strings, Vectors; Wrapper Classes.

Interfaces: Introduction; Defining Interfaces; Extending Interfaces; Implementing Interfaces.

Packages: Introduction; System Packages; Creating Packages; Accessing a Package; Using a Package; Adding a Class to a Package.

Unit-4

Managing Errors and Exceptions: - Introduction; Types of Errors, Exceptions; Syntax of Exception Handling Code; Multiple Catch Statements; Using finally Statement; Throwing Our Own Exceptions.

Applet Programming: - Introduction; How Applets Differ from Applications; Building Applet Code; Applet Life Cycle , Creating an Executable Applet; Applet Tag; Adding Applet to HTML File; Running the Applet; Passing Parameters to Applets; Aligning the Display; Displaying Numerical Values.

Recommended Books:

1. Programming In Java, E-Balagurusami, Fourth Edition, Tata McGraw Hill
2. Mastering Java, Second Edition, BPB Publications
3. Advance Java, Ivan Bayross, BPB Publications

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3504	Project Work-I (Minor Project)	1	0	6	4

Tools for Minor Project

Frontend **VB, PHP , .NET (Either VB .Net or ASP .Net) or Java**

Backend **MS Access, Sql Server or Oracle**

In Minor Projects 2 normal applications and one database related application is must

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3505	Software Lab-VI (Core Java)	0	0	4	2

List of Programs (not limiting to):

1. Write a program to print a message on the screen "welcome to java"
2. Write a program to show the scope and life time of a variable
3. Write a program to check whether given character is vowel or not.
4. Write a program to calculate sum of digits of 4-digit number
5. Write a program to check whether a number is prime or not.
6. Write a program to check whether a number is palindrome or not.
7. Write a program to demonstrate the difference between Break and Continue statement.
8. Write a program to illustrate the concept of Switch statement.
9. Write a program to search a given number in a given array.
10. Write a program to search Maximum and Minimum in an array.
11. Write a program to multiply two matrices.
12. Write a program to read input from the user.
13. Write a program to implement the concept of 'super' keyword.
14. Write a program to implement the concept of 'final' keyword.
15. Write a program to implement the concept of default constructor.
16. Write a program to implement the concept of parameterized constructor.
17. Write a program of constructor overloading.
18. Write a program to implement the concept of single inheritance.
19. Write a program to implement the concept of multi-level inheritance.
20. Write a program to implement interface
21. Write a program to implement package
22. Write a program to implement exception handling using try and catch block.
23. Write a program to create and execute thread.
24. Write a program to design an applet.

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3506	Software Lab-VII (Advanced Database Systems)	0	0	4	2

List of the Programs (not limiting to):

- **Creating Database**
  - Creating a Database
  - Creating a Table
  - Specifying Relational Data Types
  - Specifying Constraints
  - Creating Indexes
- **Table and Record Handling**
  - INSERT statement
  - Using SELECT and INSERT together
  - DELETE, UPDATE, TRUNCATE statements
  - DROP, ALTER statements
- **Retrieving Data from a Database**
  - The SELECT statement
  - Using the WHERE clause
  - Using Logical Operators in the WHERE clause
- Using IN, BETWEEN, LIKE , ORDER BY, GROUP BY and HAVING
- **Clause**
  - Using Aggregate Functions
  - Combining Tables Using JOINS
  - sub- queries
- **Database Management**
  - Creating Views
  - Creating Column Aliases
  - Creating Database Users
  - Using GRANT and REVOKE

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
FS3507	Finishing School –V	1	-	2	2

Unit I (6 hours) - Video Profile
Unit II (6 hours) - Tech Talk / Area of Interest / Extempore / Company Profile
Unit III (6 hours) - Curriculum Vitae
Unit IV (6 hours) - Mock Interview
Unit V (6 hours) - Group Discussion / Case Study

ASSESSMENT

Objective type – Paper based / Online – 50 marks based on Continuous Communication Assessment.

BCA 6th Semester Syllabus

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3601	Computer Graphics	3	1	0	4

Unit- 1

Input devices: Keyboard, Touch panel, light pens, Graphic tablets, Joysticks, Trackball, Data glove, Digitizers, Image scanner, Mouse, Voice & Systems. **Hard copy devices**: Impact and non impact printers, such as line printer, dot matrix, laser, ink-jet, electrostatic, flatbed and drum plotters.

Unit-2

Video Display Devices Refresh cathode -ray tube, raster scan displays, random scan displays, color CRT-monitors, direct view storage tube, flat-panel displays; **3-D viewing devices**, raster scan systems, random scan systems, graphics monitors and workstations.

Unit-3

Scan conversion algorithms for line, circle and ellipse, Bresenham's algorithms, area filling techniques, character generation. **2-dimensional Graphics**: Cartesian and Homogeneous co-ordinate system, Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Two-dimensional viewing transformation and clipping (line, polygon and text).

Unit-4

3-dimensional Graphics: Geometric transformations (translation, Scaling, Rotation, Reflection, Shearing), Mathematics of Projections (parallel & perspective). 3-D viewing transformations and clipping.

Recommended Books:

1. D. Hearn and M.P. Baker, "Computer Graphics", PHI New Delhi;
Second Edition, 1995.
2 J.D. Foley, A.V. Dam, "Introduction to Computer Graphics",
S.K. Feiner,J.F. Hughes, Addison-Wesley Publishing company,
R.L. Phillips. N.Y.; Second Edition, 1994.
3. R.A. Plastock and G. Kalley, "Computer Graphics", McGraw Hill, 1986.

Sub code	BCA 6 Semester Syllabus	L	T	P	C
	Subject Name				
BC3602	Computer Networks	3	1	0	4

Unit -1

Introduction to Data Communication: Components of Data Communication, Data Representation, analog Vs Digital Communication, Fourier Analysis, Band Width limitation, data rate of a channel, Error detection and correction; nature of errors, parity check, CRC, hamming code, Modulation; Multiplexing: SDM, FDM, TDM, STDM.

Unit -2

Introduction to computer networks and application; network hardware, network software, OSI reference model, TCP/IP model, network standardization, physical layer: circuit switching, packet switching, message switching, terminal handling, telephone system, modems, connections, transmission media.

Unit -3

Data link layer: design issues, elementary data link protocols sliding window protocol, HDLC/SDLC, ALOHA, CSMA/CD, token passing, IEEE standard 802 for LAN and WAN.

Network layer: design issues, Routing algorithms: shortest path routing, flooding, distance vector routing, flow based routing, Congestion control algorithms: leaky bucket, token bucket, Internet working, the network layer in the Internet IP protocol, IP address.

Unit-4

Transport layer: design issues, elements of transport protocol, addressing establishing & releasing a connection, flow control & buffering, TCP/IP service model, TCP connection management.

Recommended Books:

1. Tanenbaum, Andrew S.,2009: Computer Networks(4thEdition),PHI.
2. Forouzan, B. A., 2009: Data Communications and Networking, Fourth Edition, Tata McGrawHill.
3. DouglasE.Comer, 2004: Internetworking with TCP/IP (Vol.1, 4thEdition), CPE.
4. Stallings,William 2008: Data and Computer Communications(8thEdition),PHI.
5. Nance, Bary, 1997: Introduction to Networking, PHI, 4thEdition

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3603	Workshop on asp.net	2	0	4	4

Unit-1

Introduction to ASP.NET: .NET Framework, ASP.NET Basics, ASP.NET Page Structure, Page Life Cycle.
Controls: HTML Server Controls, Web Server Controls, Web User Controls, Validation Controls, Custom Web Controls.

Unit –2

State Management: View State, Control State, Hidden Fields, Cookies, Query Strings, Application State, Session State, Profile Properties, Master Pages, Themes, Site Navigation.

Unit- 3

Introduction to ADO.NET: Data Binding, Importing the SqlClient Namespace, Defining the Database Connection, Managing Content Using Grid View and Details View.

Unit-4

Security and User Authentication: Basic Security Guidelines, Securing ASP.NET Applications, ASP.NET Memberships and Roles.

Recommended Books:

1. Beginning ASP.NET 4: in C# and VB (Wrox), Imar Spaanjaars, Paperback Edition
2. Sams Teach Yourself ASP.NET 4 in 24 Hours, Complete Starter Kit Scott Mitchell
3. Microsoft ASP.NET 4 Step by Step (Microsoft), George Shepherd, Paperback Edition

Websites:

www.asp.net

www.w3schools.com

www.learn-asp.net

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3604	Workshop on Advanced Java	2	0	4	4

Unit-1

Graphics Programming: - Introduction; Graphics Class; Lines and Rectangles; Circles and Ellipses; Drawing Arcs; Drawing Polygons; Line Graphs; Using Control Loops in Applets; Drawing Bar Charts.
Java Awt: java AWT package Containers (Component, Container, Panel, Window, Frame, Canvas), Basic User Interface components (Labels, Buttons, Check Boxes, Radio Buttons, Choice, Text Fields, Text Areas, Scrollbars), Layouts (Flow Layout, Grid Layout, Border Layout, Card Layout).

Unit-2

Event Handling: Event delegation Approach, ActionListener, AdjustmentListener, MouseListener and MouseMotionListener, WindowListener, KeyListener.
JAVA I/O HANDLING : I/O File Handling (InputStyream & OutputStreams, FileInputStream & FileOutputStream, Data I/P and O/P Streams, Buffered I/P and O/P Streams, File Class, Reader and Writer Streams, Random Access File).

Unit- 3

Multithreading: Overview of Multithreading, The Thread control methods, Thread life cycle, Newly created threads, Main thread, Creating a Thread (Implementing Runnable Interface, Extending the Thread Class), Thread Synchronization, Writing Applets with Threads.
Socket Programming: Introduction, TCP/IP Protocol, UDP Protocol, Ports, Using TCP/IP Sockets, Using UDP Sockets.

Unit-4

Java Database Connectivity (Jdbc): JDBC/ODBC bridge, DriverManager Class, Java.SQL Package (Connection Interface, Statement Interface, Prepared Statement Interface, ResultSet Interface, ResultSetMetaData Interface), SQL Exception class.

Recommended Books:

1. Programming In Java, E-Balagurusami, Fourth Edition, Tata McGraw Hill
2. Mastering Java, Second Edition, BPB Publications
3. Advance Java, Ivan Bayross, BPB Publications

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3605	Software Lab-VIII (Computer Graphics)	0	0	4	2

Implement the Following Algorithms using C/C++.

1. Line Drawing Algorithm like DDA, Bresenham.
2. Draw a circle using Bresenham Algorithm.
3. Draw an ellipse using Bresenham Algorithm.
4. To move a character along circle.
5. To rotate a character.
6. To show 2D Clipping and Windowing.

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3606	Major Project Work	1	0	6	4

Project Work (Code Generation, system testing, Installation and Operations & maintenance)

Tools for Project Work

Frontend **PHP, VB , .NET (Either VB .Net or ASP .Net) or Java**

Backend **MS ACCESS, SQL Server or Oracle**

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
FS3607	Finishing School-VI	1	-	2	2

Unit I - Arithmetic-II (6 hours)
Ratios & Proportions, Averages, Mixtures & Solutions

Unit II- Arithmetic-III (6 hours)
Time, Speed & Distance, Time & Work

Unit III – Algebra-IV (6 hours)
Quadratic Equations, Linear equations & inequalities

Unit IV– Geometry (6 hours)
2D Geometry, Trigonometry, Mensuration

Unit V – Modern Mathematics – II (6 hours)
Sets & Functions, Sequences & Series, Data Interpretation, Data Sufficiency

ASSESSMENT
1. Objective type – Paper based / Online – Time based test 50 marks