

University School of Management Studies

Study Scheme and Syllabus

Batch 2015 Onwards

Programme : Computer Applications

Level : Undergraduate

Course : BCA

Semester: 1st

S. No	Subject code	Subject Name	L	T	P	Total hours per week	Credits
1	BC1101	Principle of Management	4			4	4
2	BC1102	Algorithm design and Programming Fundamentals	3	1		4	4
3	MA 1103	Basic Mathematics	3	1		4	4
4	BC 1104	Communication Skills	3		2	6	4
5	BC1105	Workshop on Information Technology	3		2	5	4
6	BC1106	Software Lab-I (Algorithm design and Programming Fundamentals)			4	4	2
7	HV1107	Human Values and Professional Ethics	2			2	2
8	FS1108	Finishing School-I			2	2	1
9	IE1109	Industry Interface					1
Total			18	2	10		26

Semester: 2nd

S. No	Subject code	Subject Name	L	T	P	Total hours per week	Credits
1	BC1201	Programming in C	3	1		4	4
2	BC1202	System Analysis & Design	3	1		4	4
3	BC1203	Workshop on PC-H/w	2		4	6	4
4	BC1204	Workshop On Web Development-1	2		4	6	4
5	BC1205	Software Lab-II (Programming in C)			4	4	2
6	EV1206	Environmental Sciences	2			2	2
7	FS1207	Finishing School-II			2	2	1
8	IE1208	Industry Interface				0	1
Total			12	2	14		22

Semester: 3rd

S. No	Subject code	Subject Name	L	T	P	Total hours per week	Credits
1	BC2301	Software Engineering	4			4	4
2	BC2302	Digital Electronics	3	1		4	4
3	BC2303	OOPS and Programming in C++	3	1		4	4
4	BC2304	Operating Systems	4			4	4
5	BC2305	Workshop On Web Development-II	2		4	6	4
6	BC2306	Software Lab-III (Programming in C++)			4	4	2
7	BC2307	Hardware Lab-I (Digital Electronics)			4	4	2
8	FS2308	Finishing School-III			2	2	1
9	IE2309	Industry Interface					1
Total			17	2	14		26

Semester: 4th

S. No	Subject code	Subject Name	L	T	P	Total hours per week	Credits
1	BC2401	Data Structures-I	3	1		4	4
2	BC2402	Computer System Architecture	3	1		4	4
3	BC2403	Database Management Systems	4			4	4
4	BC2404	Workshop on Visual Basic	2		4	6	4
5	BC2405	Software Lab -IV(Data Structures-I)			4	4	2
6	BC2406	Software Lab-V (Database Management Systems)			4	4	2
7	FS2407	Finishing School-IV			2	2	1
8	IE2408	Industry Interface					1
9	BC2409	Six Week industrial training					1
Total			12	2	14		23

Semester: 5th

S. No	Subject code	Subject Name	L	T	P	Total hours per week	Credits
1	BC3501	Advanced database Systems	4			4	4
2	BC3502	Data Structures-II	3	1		4	4
3	BC3503	Programming in Java- I	3	1		4	4
4	BC3504	Workshop on PHP	2		4	6	4
5	BC3505	Software Lab-VI (Programming in Java- I)			4	4	2
6	BC3506	Software Lab-VII (Advanced Database Systems)			4	4	2
7	FS3507	Finishing School-V			2	2	1
8	IE3508	Industry Interface					1
Total			12	2	14		22

Semester: 6th

S. No	Subject code	Subject Name	L	T	P	Total hours per week	Credits
1	BC3601	Computer Graphics	3	1		4	4
2	BC3602	Computer Networks	3	1		4	4
3	BC3603	Workshop on asp.net	2		4	6	4
4	BC3604	Programming in Java- II	2		4	6	4
5	BC3605	Software Lab-VIII (Computer Graphics)			4	4	2
6	BC3606	Major Project Work	1		6	7	4
7	FS3607	Finishing School-VI			2	2	1
8	IE3608	Industry Interface				0	1
Total			12	2	20		24



BCA 1st Semester Syllabus

BCA I Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1101	Principles of Management	4	-	-	4

Unit 1

Management: Meaning and definition, nature, purpose, scope, importance and functions, Management as art, science and profession, Management as a social system, Concept of management, administration and organization. Principles of management, Scientific Management.

Evolution of Management Thought: Contribution of F.W.Taylor, Henri Fayol, Elton Mayo, Chester Barnard & Peter Drucker to the management thought. Various approaches to management (i.e. Schools of Management Thought), Indian management thought.

Management Techniques: Management by Objective: Meaning, Process, Benefits, And Weaknesses.

Unit 2

Planning: Meaning, Significance, Types of plans, Nature, Planning process. Elements: Objectives, Policies, Rules, Procedure, Strategy. **Decision Making:** concept, importance, types, process **Organizing:** Meaning, Nature and Purpose of organization, Theories of organization, principles of organization, Forms of organization: Line, Functional and Line and Staff, Formal and informal organization, Delegation, Span of Management: Factors determining effective span.

Unit 3

Departmentation: Definition, Departmentation by function, Territory, Product/service, Customer group and matrix organization, Decentralization and Departmentation.

Authority: Definition, types, responsibility and accountability, delegation; definition, steps in delegation, obstacles to delegation and their elimination, decentralization vs centralization, determinants of effective decentralization

Staffing: Meaning, nature and functions of HRM, Manpower management, factors affecting staffing, Recruitment, Selection, Training and Development, Performance appraisal: need and process.

Unit 4

Directing: Motivation: Meaning, Nature, Importance, Types, And Theories of Motivation: Mc. Gregor's, Maslow and Herzberg. **Leadership:** Meaning, Nature, Styles. **Coordination:** Principles and Techniques, Difference between coordination and cooperation. **Controlling:** Meaning, nature, importance, scope, principles, prerequisites, steps, limitations and techniques.

Recommended Books:

1. Robbins, S.P., & Coulter, M.K., "Management", Pearson Education Inc., New Delhi.
2. Gupta, Meenakshi, "Principles of Management", PHI Learning Pvt. Ltd., New Delhi.
3. Koontz, H., Wehrich, H., & Aryasri, A.R., "Essentials of Management", Tata McGraw-Hill, New Delhi.
4. Aswathapa, K. "Essential of Business Administration", Himalaya Publishing House, Mumbai.

BCA I Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1102	Algorithm design and programming Fundamentals	3	1	0	4

Unit-1

Introduction to programming: Introduction, Steps for problem solving, need of programming.

Programming approaches: procedural approach, object oriented approach, modular approach

Representing programming logic: Algorithm, Flowcharts: Terminal, Input/output, Processing, Decision, Connector, Flow Lines.

Unit-2

Programming languages: Machine Languages, Assembly Languages, High level language.

Translators: Compiler, interpreter. Linkers and loaders.

Overview of C: Introduction, Brief History of C, why use C, Structure of C program, **Error:** Syntax errors (compiler), Runtime errors, Linker error, logical errors. C program Development Stages.

Unit- 3

Demonstration Tour: Installing C, Invoking Turbo C, Typing Source Code, Saving the program, running the program, exiting from IDE, Shortcuts.

Comments: Single line comment, multi line comments. A short C program: The main() function, the #include Directive, The variable definition, Program Statements, printf(), scanf(), Program Comments, Braces

Unit- 4

Constant, Variables & Data Types: Introduction, Character Set, C Tokens, Keywords and identifiers, constants: Numeric Constants: Integer constants, Real constants. Character constants: Single Character, String character constant. Variables, data types.

Operators, Expressions & Statement: Introduction, operators: The Arithmetic operator, relational Operators, Logical operators, Assignment operator, Increment / Decrement Operators , Conditional or ternary operators, Bitwise operators: Shift right operators, Shift left operator , 1's complement operators, Bitwise AND operator, Bitwise OR operator, Bitwise exclusive OR Operator. Special operators.

Recommended Books:

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

BCA I Semester Syllabus

Sub code	Subject Name	L	T	P	C
MA 1103	Basic Mathematics	3	1	0	4

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

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 Cramer's rule and matrix inversion method.

Unit-3

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-4

DIFFERENTIAL CALCULUS

Introduction to differentiation, derivative of a function of one variable, power functions, sum and product of two functions, function of a function

Recommended Books:

1. Numerical Methods to Engineering., B.S.Grewal, Khanna Publishers
2. Business Mathematics, D.C.Sancheti, Sultan Chand & Sons
3. Computer Oriented Numerical Methods, Rajaraman, PHI Publications

BCA I Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1104	Communication Skills	3	-	2	4

Unit 1

Business communication- its meaning and importance, barriers to effective communication, types of communication- verbal and non- verbal, essentials of effective Business communication. Communication- 7 C's of communication.

Unit 2

Business letter writing- needs, functions, and kinds, layout of letter writing, types of letter writing; persuasive letters, request letters, sales letters, complaints and adjustments, interview letters, promotion letters, resignation letters, newsletters, circulars, agenda, notice, advertisement, office memorandum, office orders, press release, job application, leave application.

Resume writing- planning, organizing contents, layout, guidelines for good resume.

Report writing- structure, types, formats, drafting of various types of report

Unit 3

Developing speaking skills- advantages and disadvantages;

Group Discussion- nature, uses and importance, guidelines for GD;

Speech- how to sequence the speech with proper introduction and conclusion;

Presentations- 4P's of presentations, Structuring, rehearsing, and delivery methods, effective presentations;

Interviews- Preparation techniques, frequently asked questions, projecting a positive image.

Unit 4

Listening skills- its importance, types, barriers to listening and remedies to overcome listening barriers.

Non-verbal Communication- personal appearance, posture, gestures, facial expressions, eye contact, space distancing.

Recommended Books:

1. Pal, Rajendra & Korlahalli, *Essentials of Business Communication*, Sultan Chand and Sons
2. Bovee, Thill and Chaturvedi, *Business Communication*, Pearson Education
3. Meenakshi, Raman, Parkash Singh, *Business Communication*, Paperback Edition, Oxford University Press.

BCA I Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1105	Workshop on Information Technology	3	0	4	5

Unit -1

Computer Basics: Definition, Block diagram of a computer , Characteristics of computer, History of computer, Classification of computer, Generations of computers.

Input/output devices: Input/ Output unit, input devices.

Unit – 2

Processor and Memory: Central Processing Unit (CPU), Main memory, Secondary Memory. Read Only Memory, Random Access Memory, Hard Disk, Compact Disk, Magnetic Tape Drives, Flash Drive.

Unit- 3

Software: Introduction, Definition of software, relationship between software and hardware, categories of software (System Software, Application Software, Service software).

Communications and Internet: Introduction to Computer Communications, Computer Networks, Types of Networks, LAN, MAN and WAN, Client and Servers, Host & Terminals, TCP/IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet.

Unit-4

File and Folder Operation: Introduction, Handling Files and Folders.

DOS commands: Typical DOS commands, making simple batch files, Familiarizing with PC and WINDOWS commands, file creation, editing and directory creation. Mastery of DOS commands

Microsoft Office: - Introduction, Microsoft Word, Microsoft Excel, Microsoft PowerPoint

Microsoft Word: Introduction, editing tools, Inserting tools and all commands including mail merge, macro, Track changes.

Microsoft Excel :Creating a Worksheet: Comment inserting, Formulas that decisions, Merging workbooks, rows of columns in an outline ungroup rows, Printing column and Row Labels on Every page protecting a Workbook Ranges, Naming, Seeking Goals, sheets Naming, Working With Workbooks.

Microsoft PowerPoint: Creating presentation Using auto content wizard, creating new presentation, Introduction, changing views.

Recommended Books:

1. "Computer Fundamentals"- Pradeep K.Sinha, Preeti Shina-BPB Publications
2. "Computers Today", D. H. Sanders, McGraw Hill
3. "Fundamentals of Computers", V. Rajaraman, Prentice Hall of India, New Delhi.
4. "Information Technology", Satish Jain, BPB.
5. "Information Technology Inside and Outside", David Cyganski, John A, Pearson Education ..
6. "Computer Fundamentals", B. Ram, Third Edition, Wiley.
7. "Fundamentals of Information Technology", Chetan Srivastva, Kalayani Publishers
8. 'Computers', Larry long & Nancy long, Prentice Hall
9. "Fundamentals of Information Technology Office" - Mandeep Handa, virender Singh , Sonika Narang, Vinod Kamboj, Rupesh Sharma - ABS publication

BCA I Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1106	Software Lab-I (Algorithm design and programming Fundamentals)	0	0	4	2

List of Programs

1. Program to find sum of two numbers.
2. Program to find the circumference of circle using input value.
3. Program to test whether an entered number is positive, negatives or zero.
4. Program to find sum and average of numbers up to value X divisible by N.
5. Program to calculate gross salary.
6. Program to interchange two numbers.
7. Program to input five digit numbers and find its reverse.
8. Program to convert time in seconds to time in hours, minutes and seconds.
9. Program to convert temperature from Fahrenheit to Celsius.
10. Program to find the number is odd or even.
11. Program to find greater between two numbers.

Note: Each program should be fully documented with Input Output data and Flow charts and algorithm needs to be developed.

BCA I Semester Syllabus

Sub code	Subject Name	L	T	P	C
HV1107	Human Values & Professional Ethics	2	-	-	2

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:

Recommended Books:

1. R R Gaur, R Sangal, G P Bagaria, A Foundation Course in Value Education.
2. B L Bajpai, Indian Ethos and Modern Management, New Royal Book Co., Lucknow.
3. A Nagraj, Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. PL Dhar, RR Gaur, Science and Humanism, Commonwealth Publishers.
5. A.N. Tripathy, Human Values, New Age International Publishers.

BCA I Semester Syllabus

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

Unit I - Self Analysis (4 Hours)

SWOT Analysis, Self Introduction, Who am I, My attributes, Importance of Self Confidence, Self Esteem

Unit II - Attitude (4 Hours)

Factors influencing Attitude, Challenges and lessons from Attitude, Change Management Exploring Challenges, Risking Comfort Zone, Managing Change

Unit III - Motivation (6 Hours)

Factors of motivation, Self talk, Intrinsic & Extrinsic Motivators.

Unit IV - 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.

Unit V - Creativity (10 Hours)

Out of box thinking, Lateral Thinking

Unit VI- Presentation (1 Hour Per Student)

ASSESSMENT

1. A continuous assessment for 30 marks based on class room interaction, activities etc.
2. Presentation – 20 marks



BCA 2nd Semester Syllabus

BCA 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1201	Programming in C	3	1	0	4

Unit-1

Introduction: Introduction to ‘C’ Language, Build in Operators and function: Console based I/O and related built in I/O function: printf(), scanf(), getch(), getchar(), putchar(); Concept of header files.

Control structures: Decision making structures: If, If-else, Nested If-else, Switch. Loop Control structures: While, Do- while, for, Nested for loop; other statements: break, continue, goto, exit.

Unit-2

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.

Arrays: Introduction to Arrays, Array Declaration, Single and Multidimensional Array, Memory Representation, Matrices,

Unit-3

Strings: Strings, String handling functions.

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

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

Unit-4

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers, Pointers and Arrays , function & strings, functions & structures.

Recommended Books:

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

BCA 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC 1202	System Analysis & Design	3	1	0	4

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 analysis and Design: Analysis tools, data flow diagram, data dictionary, decision tree, structured English and decision table.

System Design: The process and stages of systems design input/output and file 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: Corrective maintenance, Adaptive maintenance and Perfective maintenance.

Recommended Books:

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

BCA 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1203	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.

BCA 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1204	Workshop On Web Development-I	2	0	4	4

Unit-1

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

Unit-2

Introduction to Web Development: Website, Webpage, Static Website, Dynamic Website.

Introduction to HTML: HTML Basics, HTML Elements (Tags), Structure of HTML Program, Attributes.

Unit-3

Headings, Paragraphs, Formatting, Links, Images, Tables,

Unit-4

Lists, Forms, Frames, Where to put Tables, Lists, Images, Forms.

Recommended Books:

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

Websites:

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

BCA 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC1205	Software Lab-II (Programming in C)	0	0	4	2

List of Programs (Not limiting to)

- [1] Write a program to print even number up to n.
- [2] Write a program to print odd number up to n.
- [3] Write a program to print table.
- [4] Write a program using while to print the sum of any numbers.
- [5] Write a program to find the sum of first 100 +ve integers.
- [6] Write a program to find the sum of even or odd number from 100+ve integers.
- [7] Write a program to find whether the given number is prime or not.
- [8] Write a program to print first N prime numbers.
- [9] Write a program to check whether the given number is an Armstrong number.
- [10] Write a program whether the character is a vowel or not by using switch statement
- [11] WAP to divide a number with 2 using bitwise operator
- [12] WAP to read a number between 1 to 7 and print day of the week using switch statement.
- [13] WAP to read marks of a student in three subjects and calculate its percentage and division acc to conditions:
 - Per \geq 60 implies division=First
 - 50 \leq per $<$ 60 implies division=Second
 - 40 \leq per $<$ 50 implies division=Third
 - Per $<$ 40 implies result =fail
- [14] WAP to generate a series of prime numbers between 2 to n.
- [15] WAP to print
 - 1
 - 22
 - 333
 - 4444
 - 55555
 - 4444
 - 333
 - 22
 - 1
- [16] WAP to find roots of a quadratic equation.
- [17] WAP to find sum of Fibonacci series upto n.
- [18] WAP to reverse the elements of an array.
- [19] WAP to add two matrices
- [20] WAP to multiply two matrices.
- [21] WAP to enter a string and check if it is palindrome or not.
- [22] WAP to find a substring in a given string S.

BCA 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
ES1206	Environmental Sciences	2	-	-	2

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,Universal Law Publishing Co. Pvt. Ltd., New Delhi.
7. Road Safety Signage and Signs, 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 2 Semester Syllabus

Sub code	Subject Name	L	T	P	C
FS1207	Finishing School -II	-	-	2	1

Unit I - Interpersonal Skills (6 Hours)

Understanding the relationship between Leadership Networking & Team work, Realizing Ones Skills in Leadership, Networking & Team Work, and Assessing Interpersonal Skills Situation description of Interpersonal Skill.

Team Work

Necessity of Team Work Personally, Socially and Educationally

Unit II - Leadership (4 Hours)

Skills for a good Leader, Assessment of Leadership Skills

Change Management Exploring Challenges, Risking Comfort Zone, Managing Change

Unit III- Stress Management (6 Hours)

Causes of Stress and its impact, how to manage & distress, Understanding the circle of control, Stress Busters.

Emotional Intelligence What is Emotional Intelligence, emotional quotient why Emotional Intelligence matters, Emotion Scales, Managing Emotions.

Unit IV- Conflict Resolution (4 Hours)

Conflicts in Human Relations – Reasons Case Studies, Approaches to conflict resolution.

Unit V - Decision Making (10 Hours)

Importance and necessity of Decision Making, process of Decision Making, Practical way of Decision Making, Weighing Positives & Negatives.

Unit VI- Presentation (1 Hour per Student)

ASSESSMENT

1. A continuous assessment for 30 marks based on class room interaction, activities etc.
2. Presentation – 20 marks

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 “, McGraw Hill
2. R.E. Fairley, "Software Engineering Concepts", McGraw Hill.
3. Jalota, "An Integrated Approach to Software Engineering", 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

BCA 3 Semester Syllabus

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.

BCA 3 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2303	OOPS and Programming in C++	3	1	0	4

Unit-1

Introduction: Object oriented programming, characteristics of object orientated languages, classes, C & C++. Program Statements, Variables and constants, Loops and Decisions
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++. **Functions:** Defining a function, function arguments & passing by value, arrays & pointers, function & strings, functions & structures.

Unit-2

Classes & Objects: 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

Unit-3

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

Unit-4

Function Overloading & Operator Overloading: Binary & Unary, **Polymorphism:** Definition, early Binding, Polymorphism with pointers, Virtual Functions, late binding, pure virtual functions.

Recommended Books:

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

BCA 3 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2304	Operating Systems	4	0	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, 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., Published by Addison Wesley.
4. Operating system by Milan Milenkovic.
5. Operating system by Stalling, W., Published by Prentice Hall (India)

BCA 3 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2305	Workshop On Web Development-II	2	0	4	4

Unit-1

DHTML Introduction : CSS and Forms in DHTML

Unit-2

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.

Unit-3

Introduction to Dreamweaver: Understanding Workspace Layout, Managing Websites.

Unit-4

Creating a Website, Using Dreamweaver Templates, Adding New WebPages, Text and Page Format, Inserting Tables, Lists, Images, Adding Links.

Recommended Books:

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

Websites:

1. www.w3schools.com
2. www.html.net
3. www.thesitewizard.com
4. www.learn-dreamweaver-tutorials.com

BCA 3 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2306	Software Lab-III (Programming in C++)	0	0	4	2

List of programs (Not limiting to)

1. Write a program to display “Hello World” in ‘C++’ language
2. Implementation of input and output statements
3. Implementation of control statements.
4. Implementation of functions.
5. Implementation of single dimension, two dimension arrays.
6. Multiplication of matrices.
7. Write C++ programs that illustrate how the following forms of inheritance are supported:
 - a) Single inheritance
 - b) Multiple inheritance
 - c) Multi inheritance
 - d) Hierarchical inheritance
8. Write a C++ program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.
9. Write a C++ program that illustrates how run time polymorphism is achieved using virtual functions.
10. Write a C++ program that illustrates the role of virtual base class in building class hierarchy.
11. Note: Use the following in solving the above problems wherever they make sense:
 - a) Constructors and destructors.
 - b) Overloaded functions.
 - c) Overloaded operator.
 - .
 - .

BCA 3 Semester Syllabus

Subject code	Subject Name	L	T	P	C
BC2307	Hardware Lab-I (Digital Electronics)	0	0	4	2

List of 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.

BCA 3 Semester Syllabus

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

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	3	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
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	Computer System Architecture	3	1	0	4

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.

Unit-2

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.

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)

Unit-3

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-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).

Recommended Books:

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

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2403	Database Management Systems	4	0	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 dependencies, 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, Pearson Education, New Delhi.
2. An Introduction to Database Systems by C.J. Date, Pearson Education, New Delhi.
3. A Guide to the SQL Standard, Data, C. and Darwen, H., Addison-Wesley Publications, New Delhi.

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2404	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, TMH.
2. Essentials of Visual Basic 6.0 Programming, David I. Schneider, Prentice Hall
3. Visual Basic 6: The Complete Reference, Noel Jerke, TMH

BCA 4 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC2405	Software Lab -IV(Data Structures-I)	0	0	4	2

List of Programs (not limiting to):

1. Program using Recursion.
2. Traversing the elements of an Array
3. Inserting an element in an Array
4. Deleting an element from an Array
5. Merging of two Arrays
6. Linear Search
7. Binary Search
8. Insertion Sort
9. Bubble Sort
10. Selection Sort
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
BC2406	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
FS2407	Finishing School- IV	-	-	2	1

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	4	0	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	Programming in Java- I	3	1	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	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.

BCA 5 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3505	Software Lab-VI (Programming in Java- I)	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 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
 - 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	-	-	2	1

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 coordinate 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..
2. J.D. Foley, A.V. Dam, "Introduction to Computer Graphics",
3. S.K. Feiner, J.F. Hughes, Addison-Wesley Publishing company, R.L. Phillips. N.Y.
4. R.A. Plastock and G. Kalley, "Computer Graphics", McGraw Hill.

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
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: Computer Networks PHI.
2. Forouzan, B. A., Data Communications and Networking,, Tata McGrawHill.
3. DouglasE.Comer: Internetworking with TCP/IP ,CPE.
4. Stallings,William : Data and Computer Communications, PHI.
5. Nance, Bary,: Introduction to Networking, PHI.

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.
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.

Websites:

1. www.asp.net
2. www.w3schools.com
3. www.learn-asp.net

BCA 6 Semester Syllabus

Sub code	Subject Name	L	T	P	C
BC3604	Programming in Java- II	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 (InputStream & 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, Tata McGraw Hill
2. Mastering Java, 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

Reports

Backend

VB or .NET (Either VB .Net or ASP .Net) or Java

Crystal Reports

SQL Server or Oracle

BCA 6 Semester Syllabus

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

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

Bachelor of Computer Application (BCA):

Objectives: The objectives of the Programme shall be to provide sound academic base from which an advanced career in Computer Application can be developed. Conceptual grounding in computer usage as well as its practical business application will be provided.

Duration: The duration of the B.C.A. Degree Program shall be three years divided into six semesters.

Evaluation plan :

1. Examination Pattern

Component	Frequency	Marks
1st Term	1time	30
2nd Term	1 time	30
End Term	1time	80
Continuous Assessment	Throughout the Semester	60
Total		200

2. Scheme for Evaluation of Continuous Evaluation

Component	Frequency	Marks
Assignment	8Nos.	20
Presentation	1/student or Group	10
Extempore	1/student	10
Quiz	2 times	10
Seminar		10
Total		60

