BHARTI UNIVERSITY

DURG (C.G.)

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SCHEME OF EXAMINATION

&

SYLLABUS

Of

Bachelor of Computer Application

Semester Exam

UNDER

FACULTY OF COMPUTER SCIENCE

Session 2021-22

(Approved by Board of Studies)

Effective from Oct 2021

Scheme of Examination BCA

Semester – I					
Subject Code	Paper	Credits	ESE	Internal Marks	Total marks
BCA 101	Mathematics - I	4	70	30	100
BCA 102	Business Communication	3	70	30	100
BCA 103	Programming with C	4	70	30	100
BCA 104	Fundamentals of Information Technology	4	70	30	100
BCA 105	Principles of Management	4	70	30	100
BCA 106-P	Fundamentals of IT Lab	1	35	15	50
BCA 107-P	Programming with C Lab	1	35	15	50
Total		21	420	180	600

Semester – II					
Subject Code	Paper	Credits	ESE	Internal Marks	Total marks
BCA 201	Mathematics - II	4	70	30	100
BCA 202	Business Organization	4	70	30	100
BCA 203	Digital Electronics	4	70	30	100
BCA 204	Data Structures using C	4	70	30	100
BCA 205	Database Management Systems	4	70	30	100
BCA 206-P	Practical - II (Lab)	1	35	15	50
Total		21	385	165	550

Semester – III					
Subject Code	Paper	Credits	ESE	Internal Marks	Total Marks
BCA 301	Web Designing	4	70	30	100
BCA 302	Computer Architecture	4	70	30	100
BCA 303	Front End Design Tools	4	70	30	100
BCA 304	Financial Accounting	4	70	30	100
BCA 305	Object Oriented Programming using C++	4	70	30	100
BCA 306-P	Practical - III	1	35	15	50
Total		21	385	165	550

Semester – IV					
Subject Code	Paper	Credits	ESE	Internal Marks	Total Marks
BCA 401	Management Information Systems	4	70	30	100
BCA 402	Structured Systems Analysis and Design	4	70	30	100
BCA 403	Object Technologies & Programming using java	4	70	30	100
BCA 404	Operating Systems	4	70	30	100
BCA 405	Business Economics	4	70	30	100
BCA 406-P	Practical - IV	1	35	15	50
Total		21	385	165	550
Summer Training will be held for 4 weeks after the end of fourth semester.					
Viva-Voce will be conducted in fifth semester.					

	Semester – V				
Subject Code	Paper	Credits	ESE	Internal Marks	Total marks
BCA 501	Computer Networks	4	70	30	100
BCA 502	.Net Programming	4	70	30	100
BCA 503	Linux Environment	4	70	30	100
BCA 504	Software Engineering	4	70	30	100
BCA 505-P	Practical -V	1	35	15	50
BCA 506	• Summer Project/Training	1	70	30	100
	Total	18	385	165	550

- Evaluation will be based on Summer Training held after fourth semester and will be conducted by the college committee only.

	Semester – VI				
Subject Code	Paper	Credits	ESE	Internal Marks	Total Marks
BCA 601	Artificial Intelligence	4	70	30	100
BCA 602	Mobile Computing	4	70	30	100
BCA 603	Computer Graphics & Multimedia Applications	4	70	30	100
BCA 604	E-Commerce	4	70	30	100
BCA 605-P	Practical –VI	1	35	15	50
BCA 606	Major Project	6	70	30	100
BCA 607	Environmental Science	3	70	30	100
	Total	26	455	195	650

External Marks: 70   Internal Marks: 30

UNIT – I

SETS: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian product, Cardinality of Set, Simple Applications.

DETERMINANTS: Definition, Minors, Cofactors, Properties of Determinants, Applications of determinants in finding area of triangle, Solving a system of linear equations.

MATRICES: Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and Multiplication of Matrices, Adjoint, Inverse, solving system of linear equation Cramer's Rule.

UNIT – II

RELATIONS AND FUNCTIONS: Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions.

LIMITS & CONTINUITY: Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity of a function at a Point, Continuity Over an Interval, Sum, product and quotient of continuous functions, Intermediate Value Theorem, Type of Discontinuities.

UNIT – III

DIFFERENTIATION: Derivative of a function, Derivatives of Sum, Differences, Product & Quotient of functions, Derivatives of polynomial, trigonometric, exponential, logarithmic, inverse trigonometric and implicit functions, Logarithmic Differentiation, Chain Rule and differentiation by substitution.

UNIT – IV

INTEGRATION: Indefinite Integrals, Methods of Integration by Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcendental Functions, Reduction Formulae for simple and Trigonometric Functions, Definite Integral as

Limit of Sum, Fundamental Theorem of Integral Calculus, Evaluation of definite integrals by substitution, using properties of definite integral.

Reference Books:

1. C. L. Liu: Elements of Discrete Mathematics, McGraw Hill.
2. Lipschutz, Seymour: Discrete Mathematics, Schaum's Series
3. Babu Ram: Discrete Mathematics, Vinayek Publishers, New Delhi.
4. Trembley J. P & R. Manohar: Discrete Mathematical Structure with Application to Computer Science, TMH.
5. Kenneth H. Rosen: Discrete Mathematics and its applications, TMH.
6. Doerr Alan & Levasseur Kenneth: Applied Discrete Structures for Computer Science, Galgotia Pub. Pvt. Ltd.
7. Gersting: Mathematical Structure for Computer Science, WH Freeman & Macmillan.

BCA – 102

Business Communication

External Marks: 70   Internal Marks: 30

Unit – I

Fundamental of Grammar and their Usage: How to Improve Command over Spoken and Written English with Stress on Noun, Verb, Tense and Adjective. Sentence Errors, Punctuation, Vocabulary Building to Encourage the Individual to Communicate Effectively, Common Errors in Business Writing.

Unit – II

Introduction to Business Communication: Basic Forms of Communication, Process of Communication, Principles of Effective Business Communication, 7Cs; Media of Communication: Types of Communication: Barriers of Communication (Practical exercise in communication).

Unit – III

Business letter writing: Need, Functions and Kinds, Layout of Letter Writing, Types of Letter Writing: Persuasive Letters, Request Letters, Sales Letters, Complaints and Adjustments; Departmental Communication: Meaning, Need and Types: Interview Letters, Promotion. Letters, Resignation Letters, News Letters, Circulars, Agenda, Notice, Office Memorandums, Office Orders, Press Release.

Unit – IV

Business Etiquettes and Public Speaking: Business Manners. Body Language Gestures, Email and Net Etiquettes, Etiquette of the Written Word, Etiquettes on the Telephone, Handling Business Meetings; Introducing Characteristic, Model Speeches, Role Play on Selected Topics with Case Analysis and Real Life Experiences.

Reference Books

1. Boove C. L., Thill J. V., and Chaturvedi M., (2009) Business Communication Today, Pearson Education.
2. Murphy and Hildebrandt, (2008) Effective Business Communication, McGraw Hill Education.
3. Krizan, A. C. Buddy, and Merrier, Patricia (2008) Effective Business

Communication, 7th Edition, Cengage Learning.

4. Lesikar, (2009), Business Communication: Making Connections in a Digital World, McGraw Hill Education.

5. McGraw, S. J., (2008) Basic Managerial Skills for All, 8th edition, Prentice Hall of India.

6. Wren & Martin, (2008), English Grammar and Composition, Sultan chand & Sons.

BCA – 103

Programming with C

External Marks: 70   Internal Marks: 30

UNIT – I

C basics: C character set, Identifiers and keywords, Data types, constants, variables and arrays, declarations, expressions statements, symbolic constants, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, conditional operators, bit operators.

UNIT – II

C constructs: If statement, if….else statement, if…..else if….else statement, while statement, do….while statement, for statement, switch statement, nested control statement, break operator, continue operator, comma operator, goto statement.

UNIT – III

C Functions: Function: declaration, definition & scope, recursion, call by value, call by reference. Storage Classes: automatic, external (global), static & registers.

UNIT – IV

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

UNIT – V

Structures: Structures, unions, structure passing to functions, bit fields, file handling [text (ascii), binary], Standard library functions from stdio.h, stdlib.h, conio.h, ctype.h, math.h, string.h, process.h., Macro Defination in C.

Text book:

1. Yashwant Kanetkar, "Let us C", BPB Publications, 2002

Reference Books:

1. E. Bala Guruswamy, "Programming in ANSI C", TMH, 1999.
2. Al Kelly and Ira Pohl, "A Book on C", (4th Ed.), Addison Wesley, 1999.

3. B. Kernighan and D. Ritchie, "The ANSI C Programming Language", PHI, 2000.

BCA – 104

Fundamentals of Information Technology

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction to Computers: The evolution of computers - Computer Generation from First Generation to Fifth Generation, Classifications of Computers - Micro, Mini, Mainframe and Super Computers, Distributed Computer System, Parallel Computers.

Computer Hardware – Major Components of a Digital Computer, Block Diagram of Computer, Input- Output devices, Description of Computer Input Units, Output Units, CPU.

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

UNIT – II

Number System: Decimal, Binary, Octal, Hexa decimal. Conversion - Decimal to all other number systems, Binary to octal and Hexa Decimal, Addition of binary numbers, Binary subtraction, Use of complements to represent negative numbers, Conversion of a binary fraction to a decimal fraction and decimal to binary fraction, Binary Coded Decimal(BCD), ASCII Codes, EBCDIC codes, Gray codes, Unicodes.

Algorithm and Flowcharts: Algorithm: Definition, Characteristics, Advantages and disadvantages, Examples of Flowchart: Definition, Define symbols of flowchart, Advantages and disadvantages, Examples Pseudo Code.

UNIT – III

Computer Software: System software, assemblers, compilers, interpreters, linkers Elementary, Operating System concepts, different types of operating systems, Application Software. Introduction to MS Office (MS - Word, MS - Power Point, MS - Excel).

Computer Programming and Languages: Algorithms, flow chart, decision tables, pseudo code, Low level languages and introduction to high level languages.

UNIT – IV

Data Communication and Computer Networks: Data Transmission mode, Data transmission media, Digital and Analog Transmission, What is computer Network? Network types, Network Topologies, Communication Protocol, OSI Model, TCP/IP model.

UNIT – V

The Internet: Definition, Brief History, Network Types (LAN, WAN and MAN), Client and Servers, Intranet, Extranet. Basic Services, Email, File Transfer Protocol, Telnet, Usenet News, Terminologies related to Internet: Protocol, Domain name, IP address, URL, World Wide Web.

Overview of various services on Internet: E-mail, FTP, Telnet, Chat, Instant Messaging. Internet Search Tools: Gopher, Archie, World Wide Web, Internet Service Provider.

WWW Browsers: Line Browsers, Graphical Browsers, Java Enabled Browsers.

Text books:

1. Alex Leon & Mathews Leon,"Fundamentals of Information Technology", Leon Techworld, 1999.
2. Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi, 2004
3. P. K. Sinha & Priti Sinha , "Computer Fundamentals", BPB Publications, 1992.

Reference Books:

1. V. Raja Raman, "Introduction to Computers", PHI, 1998.
2. Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing House, 1999.
3. Norton Peter, "Introduction to computers", 4th Ed., TMH, 2001.

BCA – 105

Principles of Management

External Marks: 70   Internal Marks: 30

Unit – I

Introduction: Concept, Nature, Process and Significance of Management; Managerial levels, skills, Functions and Roles; Management vs. Administration; Coordination as Essence of Management; Development of Management Thought: Classical, Neo-Classical, Behavioral, Systems and Contingency Approaches.

Unit – II

Planning: Nature, Scope and Objectives of Planning; Types of plans; Planning Process; Business forecasting; MBO: Concept, Types, Process and Techniques of Decision-Making; Bounded Rationality. Organizing: Concept, Nature, Process and Significance; Principles of an Organization; Span of Control; Departmentation; Types of an Organization; Authority- Responsibility; Delegation and Decentralization; Formal and Informal Organization.

Unit – III

Staffing: Concept, Nature and Importance of Staffing. Motivating and Leading: Nature and Importance of Motivation; Types of Motivation; Theories of Motivation: Maslow, Herzberg, X, Y and Z; Leadership: Meaning and Importance; Traits of a leader; Leadership Styles – Likert's Systems of Management, Tannenbaum & Schmidt Model and Managerial Grid.

Unit – IV

Controlling: Nature and Scope of Control; Types of Control; Control Process; Control Techniques – Traditional and Modern; Effective Control System.

Reference Books:

1. Robbins, (2009). Fundamentals of Management: Essentials Concepts and Applications, 6th edition, Pearson Education.
2. Stoner, Freeman and Gilbert Jr. (2010) Management, 8th Edition, Pearson Education.
3. Koontz, H. (2008), Essentials of Management, McGraw Hill Education.

4. Gupta, C. B. (2008), Management Concepts and Practices, Sultan Chand and Sons, New Delhi.

5. Ghillyer, A, W., (2008) Management- A Real World Approach, McGraw Hill Education.

6. Mukherjee, K, (2009), Principles of Management, 2nd Edition, McGraw Hill Educatio

BCA 106 – P

FUNDAMENTALS OF IT LAB

External Marks: 35   Internal Marks: 15

MS-WORD

1. Text Manipulations
2. Usage of Numbering, Bullets, Tools and Headers
3. Usage of Spell Check and Find and Replace
4. Text Formatting
5. Picture Insertion and Alignment
6. Creation of Documents Using Templates`
7. Creation of Templates
8. Mail Merge Concept
9. Copying Text and Picture From Excel
10. Creation of Tables, Formatting Tables
11. Splitting the Screen
12. Opening Multiple Document, Inserting Symbols in Documents

MS – EXCEL

1. Creation of Worksheet and Entering Information
2. Aligning, Editing Data in Cell
3. Excel Function (Date, Time, Statistical, Mathematical, Financial Functions)
4. Changing of Column Width and Row Height (Column and Range of Column)
5. Moving, copying, Inserting and Deleting Rows and Columns
6. Formatting Numbers and Other Numeric Formats
7. Drawing Borders Around Cells
8. Creation of Charts Raising Moving
9. Changing Chart Type
10. Controlling the Appearance of a Chart

MS – POWER POINT

Working with Slides

1. Creating, saving, closing presentation
2. Adding Headers and footers
3. Changing slide layout
4. Working fonts and bullets
5. Inserting Clip art: working with clipart,
6. Applying Transition and animation effects
7. Run and Slide Show

DOS

1. Basics of DOS
2. DOS (Internal & External Commands)
3. Use of Wild Card Character

BCA 106 – P

Programming in C –Lab

External Marks: 35   Internal Marks: 15

1. Programs using Basic Constructs: Fundamental data types, qualifiers- long, short, unsigned, input/output functions – scanf(), printf(), Arithmetic expressions, Evaluation of integer, real and mixed mode arithmetic expressions, truncation effect, type casting, relational and logical expressions, Conditional operators, trigonometric functions- sin(), cos(), tan(), mathematical functions – abs(), sqrt(), round() defined in math.h, printing formatted outputs using width specifier.

2. Programs using control structures: if, switch, for, while, do…while, nested structures, break and continue. Sample programs should include printing of Fibonacci numbers, prime numbers, check for armstrong numbers, summation series – exp(x), sin series etc and verification of result using built in functions, printing pyramid like pattern & other similar patterns using nested loops.

3. Programs using Arrays: Array based programs – Creation of array containing prime numbers, matrix addition, matrix multiplication, transpose of a matrix, array sorting, preparing rank lists based on marks, searching of arrays(linear) for finding price of an item. static initialization of arrays.

4. String manipulation programs : reading strings using %s, gets(), getchar(), copying one string into another, counting number of characters, vowels, words etc, searching for substring, string manipulation using functions in string.h and ctype.h.

5. User Defined Functions: Programs using return type functions, void type functions, example program using recursive functions, array sorting program using function with call by reference, function to copy one string into another, menu driven program using modular approach in programming.

6. Program using structures: array of structures, dictionary search program using structure containing arrays and array of structures.

7. Program using pointer : Initialization, pointer arithmetic - swap function to interchange two locations, array manipulation using pointers- sorting list of names using pointer array, string handling using pointers, Simple program using dynamic memory allocation.

8. Program to create a data file, reading a data file , search for record(serial search) and displaying report, simple program using command line arguments- to copy one file into another by giving file names as arguments, sorting list of names provided at command line.

SEMETER – II

BCA – 201

Mathematics – II

External Marks: 70   Internal Marks: 30

UNIT – I

Basic Statistics: Measure of Central Tendency, Preparing frequency distribution table, Mean, Mode, Median, Measureof Dispersion: Range, Varianceand Standard Deviations, Correlationand Regression.

UNIT – II

Algorithm: Algorithms, merits and demerits, Exponentiation, How to compute fast exponentiation. Linear Search, Binary Search, "Big 'O'" notation, Worst case, Advantage of logarithmic algorithms over linear algorithms, complexity.

Graph Theory: Graphs, Types of graphs, degree of vertex, sub graph, isomorphic and homeomorphic graphs, Adjacent and incidence matrices, Path Circuit; Eulerian, Hamiltonian path circuit.

UNIT – III

Tree: Trees, Minimum distance trees, Minimum weight and Minimum distance spanning trees.

Recursion: Recursively defined function.

Merge sort, Insertion sort, Bubble sort, and Decimal to Binary.

UNIT – IV

Recurrence Relations: Linear Homogeneous Recurrence Relation, Recursive procedures. Number Theory: Principle of Mathematical induction, GCD, Euclidean algorithm, Fibonacci numbers, congruences and equivalence relations, public key encryption Schemes.

Reference Books

1. Gupta S. P. and Kapoor, V. K., Fundamentals of Applied statistics, Sultan Chand & Sons, 1996.
2. Gupta S. P. and Kapoor, V. K., Fundamentals of Mathematical statistics, Sultan Chand and Sons, 1995.

3. Graybill, Introduction to Statistics, McGraw.

4. Anderson, Statistical Modelling, McGraw.

5. Babu Ram: Discrete Mathematics.

BCA – 202

Business Organization

External Marks: 70   Internal Marks: 30

Unit – I

Introduction: Concept, Nature and Scope of Business; Concept of Business as a System; Business and Environment Interface; Business Objectives; Profit Maximization vs. Social Responsibility of Business; Introduction to Business Ethics and Values.

Unit – II

Business Enterprises: Entrepreneurship – Concept & Nature; Locations of Business Enterprise (Weber's Theory); Government Policy on Industrial Location. Forms of Business Organization: Sole Proprietorship, Joint Hindu Family Firm, Partnership firm, Joint Stock Company, Cooperative Organization; Types of Companies, Choice of form of organization; Promotion of a company – Stages in formation; documentation (MOA, AOA).

Unit – III

Small Business: Scope and Role, Government Policies. Government & Business Interface – Rational and forms of Government and Business Interface.

Unit – IV

Multinationals: Concept and role of MNCs; Transactional Corporations (TNCs); International Business Risks. Business Combinations: Concept and causes of business combinations; Chambers of Commerce and Industry in India; FICCI, CII, ASSOCHAM, AIMO, etc.

Reference Books:

1. Robert; Lawrence, (2009) Modern Business Organization, McMillan India.
2. Tulsian, P. C., (2009) Business Organization & Management, 2nd edition, Pearson Education.
3. Basu, C. R. (2008) Business Organization and Management, McGraw Hill Education.
4. Basu, C, (2010) Business Organization and Management, 1st Edition, McGraw

Hill Education.

5. Gupta, C.B., (2010) Modern Business Organization and Management, Dhanpat Rai & Sons.

6. Agarwal, N. P., Tailor, R. K., (2008) Business Organization And Management, Dhanpat Rai & Sons

BCA – 203

Digital Electronics

External Marks: 70   Internal Marks: 30

UNIT – I

Boolean Algebra : Basics Laws of Boolean Algebra, Logic Gates, Simplifications of Boolean equations using K-maps, Code Conversion, (Binary, Octal, Hexadecimal), Overview of Gray codes and Excess – 3 codes.

UNIT – II

Arithmetic Circuits Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and divider. Combinational Circuits Multiplexers, De-Multiplexers, decoders, encoders, Design of code converters.

UNIT – III

Flip-flops -S-R, D, J-K, T, Clocked Flip -flop, Race around condition, Master slave Flip-Flop, Realisation of one flip-flop using other flip-flop. Shift Registers, Serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out and parallel-in- parallel-out,Bi-directional shift register.

UNIT – IV

Counters- Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter. Memory Devices - RAM, ROM, PAL & PLA

Text Books:

1. Moris Mano, "Digital Logic and Computer Design", PHI Publications, 2002
2. R. P. Jain, "Modern Digital Electronics", TMH, 3rd Edition, 2003.

References Books:

1. R. L. Tokheim, "Digital Electronics, Principles and Applications", Tata McGraw Hill, 1999.
2. W. Gothman, "Digital electronics", PHI.
3. S. Salivahanan & S. Arivyhgan. "Digital circuits and design", Vikas Publication.

BCA – 204

Data Structures using C

External Marks: 70   Internal Marks: 30

UNIT – I

Arrays: Representation of single and multidimensional arrays; sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices.

Stacks and Queues: Introduction and primitive operations on stack; Stack application: Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion from infix to postfix. Introduction and primitive operation on queues, D-queues and priority queues.

UNIT – II

Linked Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, Two way lists and Use of headers.

Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion;

UNIT – III

Multilevel indexing and B-Trees: Introduction: The invention of the B-tree; Statement of the problem; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; B-trees: working up from the bottom; Example for creating a B-tree.

UNIT – IV

Sorting Techniques: Insertion sort, selection sort, merge sort, heap sort, Quick sort, Radix Sort, Searching Techniques: linear search, binary search and hashing

Text Books:

1. E. Horowitz and S. Sahani, "Fundamentals of Data Structures", Galgotia Booksource Pvt. Ltd, 2003
2. R. S. Salaria, "Data Structure & Algorithms", Khanna Book Publishing Co. (P) Ltd., 2002.

References Books:

1. P. S. Deshpande and O.G. Kakde, "C & Data Structure", Wiley Dreamtech, 1st Edition, 2003.

2. Y. Langsam et. al., "Data Structures using C and C++", PHI, 1999.

3. Schaum's outline series, "Data Structure", TMH, 2002

BCA – 205

Database Management System

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction: Characteristics of database approach, data models, DBMS architecture and data independence, Significance of Database, Database System Applications, Advantages and Disadvantages of Database Management System, DBMS Vs RDBMS. E-R Modeling: Entity types, entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub Classes: Super classes, inheritance, specialization and generalization.

UNIT – II

File Organization: Indexed sequential access files, implementation using B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach- implementation and performance.

UNIT – III

Relational Data Model: Relational model concepts, relational constraints, relational algebra. SQL: SQL queries, programming using SQL. EER and ER to relational Mapping: Data base design using EER to relational language.

UNIT – IV

Data Normalization: Functional dependencies, Normal form up to 3rd normal form. Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

Text Books:

1. R. Elmarsi and SB Navathe, "Fundamentals of Database Systems", Addison Wesley, 4th Ed., 2004

Reference Books:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 4th Edition, McGraw Hill, 1997.

2. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan Kaufmann Publishers, 1993. A. K. Majumdar, P. Battacharya, "Data Base Management Systems", TMH, 1996.

3. Bipin Desai,"An Introduction todatabase Systems", Galgotia Publications, 1991.

BCA 206 – P

Practical – II (LAB)

External Marks: 50   Internal Marks: 15

Practical will be based on following Papers:

1. Data Structure with C
2. Database Management System (SQL Queries)

SEMESTER – III

BCA – 301

Web Designing

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic features; Web Browsers; Web Servers; Hypertext Transfer Protocol, Overview of TCP/IP and its services; URLs; Searching and Web-Casting Techniques; Search Engines and Search Tools;

UNIT – II

Web Publishing: Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML. Creating a Website and the Markup Languages (HTML, DHTML);

UNIT – III

Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts;

UNIT – IV

Images; Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes;

DHTML: Dynamic HTML, Features of DHTML, CSSP(cascading style sheet positioning) and JSSS(Java Script assisted style sheet), Layers of netscape, The ID attributes, DHTML events.

Reference Books:

1. Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill.
2. Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.
3. Thomas A. Powell, "Web Design: The Complete Reference" , 4/e, Tata

McGraw-Hill

4. Wendy Willard, "HTML Beginners Guide", Tata McGraw-Hill.

5. Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

BCA – 302

Computer Architecture

External Marks: 70   Internal Marks: 30

UNIT – I

Register Transfer and Micro-operations: Register Transfer Language, Register Transfer, Bus and Memory Transfers, Arithmetic Micro-operations, Logic Micro-operations, Shift Micro-operations, Arithmetic logic shift unit.

Basic Computer Organizations and Design: Instruction Codes, Computer Registers, Computer Instructions, Timing and Control,

UNIT – II

Basic Computer Organizations Instructions, Register reference, Accumulator, Logic Shift Unit, and Design Instruction Cycle, Memory-Reference instructions, Input - Output Instructions, Design of Central Processing Unit: Introduction, General Register Organization, Stack Organization, Instruction Formats, Addressing Modes.

UNIT – III

Computer Arithmetic: Introduction, Multiplication Algorithms, Division Algorithms, for fixed point-members.

Input-Output Organization: Peripheral Devices, Input-Output Interfaces, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, Direct Memory Access (DMA)

UNIT – IV

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

Text Books:

1. Morris Mano, Computer System Architecture, 3rd Edition, Prentice-Hall of, India, Private Limited, 1999.

Reference Books:

1. William Stallings, Computer Organization and Architecture, 4th , Edition, Prentice, Hall of India Private Limited, 2001

2. Harry & Jordan, Computer Systems Design & Architecture, Addison Wesley, Delhi, 2000.

3. Malvino, "Digital Computer Electronics: An Introduction to Micro-computers", McGraw Hill, 1993.

BCA – 303

MULTIMEDIA

External Marks: 70   Internal Marks: 30

UNIT – 1

Introductory Concepts: Multimedia – Definitions, CD-ROM and the Multimedia Highway, Uses of Multimedia, Introduction to making multimedia – The Stages of project, the requirements to make good multimedia, Multimedia skills and training, Training opportunities in Multimedia. Motivation for multimedia usage, Frequency domain analysis, Application Domain

UNIT – 2

Multimedia-Hardware and Software: Multimedia Hardware – Macintosh and Windows production Platforms, Hardware peripherals – Connections, Memory and storage devices, Media software – Basic tools, making instant multimedia, Multimedia software and Authoring tools, Production Standards.

UNIT – 3

Multimedia – making it work – multimedia building blocks – Text, Sound, Images, Animation and Video, Digitization of Audio and Video objects, Data Compression: Different algorithms concern to text, audio, video and images etc., Working Exposure on Tools like Dream Weaver, Flash, Photoshop Etc.,

UNIT – 4

Multimedia and the Internet: History, Internet working, Connections, Internet Services, The World Wide Web, Tools for the WWW – Web Servers, Web Browsers, Web page makers and editors, Plug- Ins and Delivery Vehicles, HTML, VRML, Designing for the WWW – Working on the Web, Multimedia Applications – Media Communication, Media Consumption, Media Entertainment, Media games.

UNIT – 5

Multimedia-looking towards Future: Digital Communication and New Media, Interactive Television, Digital Broadcasting, Digital Radio, Multimedia Conferencing, Assembling and delivering a project- planning and costing, Designing and Producing, content and talent, Delivering, CD-ROM technology.

Text Book:

1. S. Heath, Multimedia & Communication Systems, Focal Press, UK.
2. T. Vaughan, Multimedia: Making it work, 4th Edition, Tata McGraw Hill, New Delhi.
3. K. Andleigh and K. Thakkar, Multimedia System Design, PHI, New Delhi.

Reference Books:

1. Keyes, "Multimedia Handbook", TMH.
2. R. Steinmetz and K. Naharstedt, Multimedia: Computing, Communications & Applications, Pearson, Delhi.
3. S. Rimmer, Advanced Multimedia Programming, PHI, N

BCA – 304

Financial Accounting

External Marks: 70   Internal Marks: 30

UNIT – I

Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, Accounting standards in India.

UNIT – II

Basis of accounting-cash & accrual, Journalizing transaction, Introduction to Ledger posting and trial balance, Capital and revenue items. Application of computers in accounting, Accounting procedure used for recording cash, Bank and, journal, transactions, using, appreciate vouchers, Introduction to ledger accounting, Cash, Book,, Journal, and, bank, account, Introduction to trial balance, Profit and Loss account and balance sheet.

UNIT – III

Financial statement analysis: Ratio analysis, Funds flow analysis,, concepts, uses,, Preparation, of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break-even analysis.

UNIT – IV

Inventory valuation: Objectives, Introduction to FIFO, LIFO & Weighted Average method of inventory valuation, Valuation of inventory on balance sheet date, inventory accounting and control, Introduction to stocks & shares, Concept of cost of capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt. Theory of working capital: Nature and concepts.

Text Books:

1. Maheshwari & Maheshwari, "An Introduction to Accountancy", 8th Edition, Vikas Publishing House, 2003

References Books:

1. Gupta R. L., Gupta V. K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999. Khan & Jain, "Financial Accounting"

2. Maheshwari S. N., "Principals of Management Accounting", 11th Edition, Sultan Chand & Sons, 2001.

3. Shukla and Grewal, "Advanced Accounts", 14th Edition, Sultan Chand &, Sons.

BCA – 305

Object Oriented Programming using C++

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction: Introducing Object-Oriented Approach, Relating to other paradigms (functional, data decomposition). Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, deleteoperators.

UNIT – II

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass /abstract classes.

UNIT – III

Inheritance and Polymorphism: Inheritance: Introduction and types of Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs. classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method, polymorphism, Polymorphism by parameter, Operator overloading, Parametricpolymorphism.

UNIT – IV

Generic function – Template function, function name overloading, Overriding inheritance methods, Run time polymorphism, Multiple Inheritance.

Files and Exception Handling: Persistent objects, Streams and files, Namespaces, Exception handling, Generic Classes.

Text Books:

1. A. R. Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.
2. S. B. Lippman & J. Lajoie, "C++ Primer", 3rd Edition, Addison Wesley, 2000.

Reference Books:

1. R. Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004.

2. D. Parasons, "Object Oriented Programming with C++", BPB Publication.

3. Steven C. Lawlor, "The Art of Programming Computer Science with C++", Vikas Publication.

4. Schildt Herbert, "C++: The Complete Reference", 4th Ed., Tata McGraw Hill, 1999.

5. Tony Gadis, Watters, Muganda, "Object-Oriented Programming in C++", 3rd Ed., Wiley

Practical – II

External Marks: 35   Internal Marks: 15

Practical will be based on following Papers:

1. Object Oriented Programming using C++

Management Information System

External Marks: 70   Internal Marks: 30

UNIT – I

The meaning and role of MIS: What is MIS? Decision support systems, systems approach, the systems view of business, MIS Organization within the company.

Management Organizational theory and the systems approach: Development of organization theory, management and organizational behavior, management, information, and the systems approach.

UNIT – II

Information Systems for decision making: Evolution of an information system, Basic Information Systems, decision making and MIS, MIS as a technique for making programmed decisions, decision assisting information systems, Simon's Model of Decision Making, Structured Vs Un-structured Decisions.

Strategic and project planning for MIS: General, business planning, appropriate MIS response, MIS planning – general, MIS planning – details.

UNIT – III

Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative. Conceptual designs and select one, document the system concept, prepare the conceptual design report.

UNIT – IV

Implementation, evaluation and maintenance of the MIS: Plan the, implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train and operating personnel, computer related acquisitions, develop forms for data collection and information, dissemination, develop the files, test the system, cut over, document the system, evaluate the MIS, control and maintain the system.

Pitfalls in MIS, development: Fundamental weaknesses, soft spots, in planning, design problems, implementation: The TAR PIT, A Study of Marketing, Personnel,

Financial and Production MIS.

Text book:

1. R. G. Murdick, J. E. Ross and J. R. Clagget, "Information Systems for Modern Management", 3rd Edition by, PHI – 1994.
2. Parker, Charles Case, Thomas, "Management Information System: Strategy & Action", 2nd Edition, TMH, 1993.

BCA – 402

Structured Systems Analysis and Design

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction to system, Definition and characteristics of a system, Elements of system, Types of system, System development life cycle, Role of system analyst, Analyst/user interface, System planning and initial investigation: Introduction, Bases for planning in system analysis, Sources of project requests, Initial investigation, Fact finding, Information gathering, information gathering tools, Fact analysis, Determination of feasibility.

UNIT – II

Structured analysis, Tools of structured analysis: DFD, Data dictionary, Flow charts, Gantt charts, decision tree, decision table, structured English, Pros and cons of each tool, Feasibility study: Introduction, Objective, Types, Steps in feasibility analysis, Feasibility report, Oral presentation, Cost and benefit analysis: Identification of costs and benefits, classification of costs and benefits, Methods of determining costs and benefits, Interpret results of analysis and take final action.

UNIT – III

System Design: System design objective, Logical and physical design, Design Methodologies, structured design, Form-Driven methodology(IPO charts), structured walkthrough, Input/output and form design: Input design, Objectives of input design, Output design, Objectives of output design, Form design, Classification of forms, requirements of form design, Types of forms, Layout considerations, Form control.

UNIT – IV

System testing: Introduction, Objectives of testing, Need for system Testing, various approaches to system Testing, Test plan, testing techniques/Types of system tests, Quality assurance goals in system life cycle, System implementation, Process of implementation, System evaluation, System maintenance and its types, System documentation, Forms of documentation.

Reference Books

1. Systems Analysis and design BY e. m. a WAD Galgotia Pub.(P) Ltd.
2. Data Management and Data Structures by Loomis (PHI)
3. System Analysis and Design by Elias Awad.
4. Introductory System analysis and Design by Lee Vol. I & II

BCA – 403

Object Technologies & Programming using Java

External Marks: 70   Internal Marks: 30

UNIT-I

Object Oriented Methodology-1: Paradigms of Programming Languages, Evolution of OO Methodology, Basic Concepts of OO Approach, Comparison of Object Oriented and Procedure Oriented Approaches, Benefits of OOPs, Introduction to Common OO Language, Applications of OOPs .

Object Oriented Methodology-2: Classes and Objects, Abstraction and Encapsulation, Inheritance, Method Overriding and Polymorphism.

UNIT-II

Java Language Basics: Introduction to Java, Basic Features, Java Virtual Machine Concepts, Primitive Data Type and Variables, Java Operators, Expressions, Statements and Arrays.

Object Oriented Concepts: Class and Objects-- Class Fundamentals, Creating objects , Assigning object reference variables; Introducing Methods, Static methods, Constructors, Overloading constructors; This Keyword; Using Objects as Parameters, Argument passing, Returning objects, Method overloading, Garbage Collection, The finalize( ) Method.

Inheritance and Polymorphism: Inheritance Basics, Access Control, Multilevel Inheritance, Method Overriding, Abstract Classes, Polymorphism, Final Keyword.

UNIT-III

Packages: Defining Package, CLASSPATH, Package naming, Accessibility of Packages using Package Members.

Interfaces: Implementing Interfaces, Interface and Abstract Classes, Extends and Implements together.

Exceptions Handling: Exception, Handling of Exception, Using try-catch, catching Multiple Exceptions using finally clause, Types of Exceptions, Throwing Exceptions, and Writing Exception Subclasses.

UNIT-IV

Multithreading: Introduction, The Main Thread, Java Thread Model, Thread Priorities,

Synchronization in Java, Inter threads Communication.

I/O in Java : I/O Basics, Streams and Stream Classes, The Predefined Streams, Reading from, and Writing to, Console, Reading and Writing Files, The Transient and Volatile Modifiers, Using Instance of Native Methods.

Strings and Characters: Fundamentals of Characters and Strings, The String Class, String Operations, Data Conversion using valueof( ) Methods, String Buffer, Class and Methods.

Reference Books:

1. Programming in Java, E Balagurusamy .
2. The Complete Reference JAVA, TMH Publication.
3. Begining JAVA, Ivor Horton, WROX Public.
4. JAVA 2 UNLEASHED, Tech Media Publications.
5. Patrick Naughton and Herbertz Schildt, "Java-2 The Complete Reference", 1999, TMH.

BCA – 404

Operating System

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction, what is an Operating System, Simple Batch Systems and Multi programmed Batches systems, Time-Sharing Systems, Personal-computer systems, Parallel systems, Distributed Systems, Real-Time Systems.

Memory Management: Background, Logical versus Physical Address space, swapping, Contiguous allocation, Paging, Segmentation.

Virtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations.

UNIT – II

Processes: Process Concept, Process Scheduling, Operation on Processes CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple - Processor Scheduling.

Process Synchronization: Background, The Critical-Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization.

UNIT – III

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

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

UNIT – IV

Information Management: Introduction, A Simple File System, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System And Physical File System File-System Interface: File, Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File -System

Implementation: File - System Structure, Allocation Methods.

Text Books:

1. Silbersachatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001
2. Madnick E., Donovan J., "Operating Systems", Tata McGraw Hill, 2001

Reference Books:

1. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000

BCA – 405

Business Economics

External Marks: 70   Internal Marks: 30

UNIT – I

The Scope and Method of Economics, The Economic Problem: Scarcity & Choice, The Price Mechanism, Demand & Supply Equilibrium: The concept of Elasticity and its Applications. The Production Process: Output decisions – Revenues, Costs and Profit Maximization Laws of Returns & Returns to Scale; Economies and Diseconomies of Scale.

UNIT – II

Market Structure: Equilibrium of a Firm and Price, Output Determination Under Perfect Competition, Monopoly, Monopolistic Competition & Oligopoly.

UNIT- III

Macro Economic Concerns: Inflation, Unemployment, Trade-Cycles: Circular Flow up to Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring National Income and Output.

UNIT-IV

The World Economy – WTO, Globalization, MNCs, Outsourcing, Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of Dumping, Export- Import Policy 2004-2009.

Text Books:

1. Ahuja H. L., "Business Economics", S. Chand & Co., New Delhi, 2001.
2. Ferfuson P. R., Rothschild, R and Ferguson G. J. "Business Economics", Mac-Millan, Hampshire, 1993.
3. Karl E. Case & Ray C. Fair, "Principles of Economics", Pearson Education, Asia, 2000.
4. Nellis, Joseph, Parker David, "The Essence of Business Economics", Prentice Hall, New Delhi, 1992.

BCA 406 – P

Practical – IV

External Marks: 35   Internal Marks: 15

Practical will be based on following Paper:

1. Java Programming & Website Design

BCA – 501

Computer Networks

External Marks: 70   Internal Marks: 30

UNIT – I

Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, transmission mode, and categories of networks.

OSI and TCP/IP Models: Layers and their functions, comparison of models.

Digital Transmission: Interfaces and Modems: DTE-DCE Interface, modems, cable modems. Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon Capacity, comparison of media.

UNIT – II

Telephony: Multiplexing, error detection and correction: Many to one, one to many, WDM, TDM, FDM, circuit switching, packet switching and message switching.

Data Link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures, IP Addressing.

Point to point protocols: Transmission states, PPP layers, LCP, Authentication, NCP. ISDN: Services, historical outline, subscriber's access, ISDN, Layers, and broadband ISDN.

UNIT – III

Devices: Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, Network- Layer in the Internet, Firewall.

UNIT – IV

Transport and upper layers in OSI Model: Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer. Electronic Mail (SMTP, POP3, IMAP, MIME) – HTTP – Web Services – DNS – SNMP

Text Books:

1. A. S. Tanenbaum, "Computer Networks"; Pearson Education Asia, 4th Ed., 2003.
2. Behrouz A. Forouzan, "Data Communication and Networking", 3rd edition, Tata Mc Graw Hill, 2004.

Reference Books:

1. D. E. Comer, "Internetworking with TCP/IP", Pearson Education Asia, 2001
2. William Stallings, "Data and Computer Communications", Pearson education Asia, 7th Ed., 2002.

BCA – 502

Dot Net Programming

External Marks: 70   Internal Marks: 30

UNIT – I

.Net architecture, Namespace, Assemblies, object oriented features, memory management, interoperation with IOM, transaction in .NET, structured exception handling, code access security.

UNIT – II

VB.NET Similarities & differences with Visual Basic, windows focus, Working with menus, ADO.NET, working with databases, object oriented features.

UNIT – III

ASP.NET Similarities & difference with ASP, Architecture, web-form, development, XML, databases interface.

UNIT – IV

C++ .NET Similarities & differences with C/C++, Creating components, window form, menus, validation, database interface.

Text Books:

1. Chakraborti et. al., "Microsoft .NET framework", PHI, 2002
2. M. Reynolds et. al., ".NET Enterprise", Wrox/SPD, 2000

Reference Books:

1. Richard Blaur & Mathew Reynolds, "Beginning VB.NET 2003", 3rd Edition, Wiley Dream Tech., 2003
2. Chris Willman, John Kauffman, "Beginning ASP.NET 1.1 with VB.NET 2003", Wiley Dream Teach, 2003
3. Chris Ullman, John Kauffman, "Beginning ASP.NET with Visual #.NET 2003", Wiley Dream Tech,2003

BCA – 503

Linux Environment

External Marks: 70   Internal Marks: 30

UNIT – I

UNIX & LINUX: - Overview of UNIX and LINUX Architectures editors and commands, shell scripts, system administration, Basic Command of Linux.

LINUX Internals:

Introduction: - Data structures in LINUX kernel, process management, systems calls.

Memory Management:- Architecture independent memory model, virtual address space for a process, block devices, caching, paging under LINUX.

UNIT – II

Inter Process Communication:- Synchronization in kernel, communication via files, pipes, ptrace, system V IPC, and sockets.

UNIT – III

LINUX File System: - Representation of file system in the kernel, Proc and Ext2 file system. Modules: - Modules in LINUX, debugging.

UNIT – IV

Multiprocessing: Multiprocessing, Symmetric Multiprocessing, Changes with respect to kernel initialization, spooling, message exchange between processes, interrupt handling.

Text Books:

1. A. Silberschatz, P. B. Galvin, "Operating System Concepts", John Wiley & Sons (Asia) Pte. Ltd, 2000
2. Neil Mathew, Richard Stones, "Beginning Linux Programming", 3rd Edition, Wiley Dream Tech, 2005

Reference Books:

1. B. W. Kernighan & R. Pike, "The UNIX Programming Environment", Prentice Hall of India, 2000
2. Cox K., "Red Hat Linux Administrator's Guide", PHI, 2001

3   M. Beck, "LINUX Kernel Internals", Addison Wesley, 1997

BCA – 504

Software Engineering

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction: Basic Framework for software engineering, Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models. Software Requirements Analysis & Specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries & E R Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.

UNIT – II

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process, The Project.

Software Project Planning: Problem Analysis, Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

UNIT – III

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics.

Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, coding the procedural design, Good coding style.

UNIT - IV

Software Testing: Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities.

Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

Configuration Management: Need, Configuration management functions and activities; Configuration management techniques.

Reference Books:

1. Gill, Nasib Singh: Software Engineering, Khanna Book Publishing Co. (P) Ltd. N. Delhi.
2. Pressman: Software Engineering, TMH.
3. Jalote, Pankaj: An Integrated Approach to Software Engineering, Narosa Publications.
4. Chhillar Rajender Singh: Software Engineering: Testing, Faults, Metrics, Excel Books, New Delhi.
5. Ghezzi, Carlo: Fundaments of Software Engineering, PHI.
6. Fairely, R.E.: Software Engineering Concepts, McGraw-Hill.
7. Lewis, T.G.: Software Engineering, McGraw-Hill.
8. Shere: Software Engineering & Management, Prentice Hall

BCA – 505 P

Practical –V

External Marks: 35   Internal Marks: 15

Practical will be based on following Papers:

1. .Net Programming,

2. Linux Environment

BCA – 506

Summer Project / Training

External Marks: 70   Internal Marks: 30

The viva will be conducted based on summer vocational training of four weeks after the end of fourth semester.

SEMESTER – VI

BCA – 601

Artificial Intelligence

External Marks: 70   Internal Marks: 30

UNIT – I

Overview of AI: Introduction to AI, Importance of AI, AI and its related field, History of AI, Proposing and evaluating AI applications, AI techniques, Criteria for success. Problems, problem space and search: Defining the problem as a state space search, Production system and its characteristics, Issues in the design of the search problem. Heuristic search techniques: Generate and test, hill climbing, best first search technique, problem reduction, constraint satisfaction

UNIT – II

Knowledge Representation: Definition and importance of knowledge, Knowledge representation, various approaches used in knowledge representation, Issues in knowledge representation.

Using Predicate Logic: Represent ting Simple Facts in logic, representing instances and is a relationship, Computable function and predicate.

UNIT - III

Natural language Processing: Introduction syntactic processing, Semantic processing, Discourse and pragmatic processing. Learning: Introduction learning, Rote learning, learning by taking advice, learning in problem solving, learning from example-induction, Explanation based learning.

UNIT - IV

Expert System: Introduction, Representing using domain specific knowledge, Expert system shells.

Reference Books

1. David W. Rolston: Principles of Artificial Intelligence and Expert System Development, McGraw Hill Book Company.
2. Elaine Rich, Kevin Knight: Artificial Intelligence, Tata McGraw Hill.
3. D. W. Patterson, "Introduction to AI and Expert Systems", PHI, 1999.

4. Nils J Nilsson,"Artificial Intelligence -A new Synthesis" 2nd Edition (2000), Harcourt Asia Ltd.

BCA – 602

Mobile Computing

External Marks: 70   Internal Marks: 30

UNIT- 1:

Introducing the Mobile Internet: Understanding the basic concepts of mobile computing, The Mobile Internet is here, The Rise of Mobile data. Key Services   for the mobile Internet, Business opportunities.

UNIT- 2:

WAP: the Mobile Internet Standard: Making the Internet Mobile: Challenges and Pitfalls, Overview of the Wireless Application Protocol.

UNIT- 3:

Implementing WAP Services: The Wireless Markup Language, Enhanced WML: WML Script and WTAI, User Interface Design: Marking Wireless Applications Easy to Use.

UNIT- 4:

Advanced WAP: Tailoring Content to the Client, Push Messaging, Wireless Telephony Applications, Building and Deploying End-to-End WAP Services. Where Next: The Mobile Internet Future.

Text Book:

1. Sandeep Singhal, "The Wireless Application, Protocol, Writing Applications for , Mobile Internet", Pearson Education, 2000,

BCA – 603

Computer Graphics & Multimedia Applications

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction: The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Applications, Development of Hardware, and Software, for Computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan Converting Lines, Scan Converting Circles, Scan Converting Ellipses. Graphics Hardware: Hardcopy Technologies, Display Technologies, Raster-Scan Display Systems, The Video Controller, Random-Scan Display Processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc.

Clipping: Southland-Cohen Algorithm, Cyrus - Beck Algorithm, Midpoint Sub-division Algorithm.

UNIT – II

Geometrical Transformations: 2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Composition of 2D Transformations, The Window-to-Viewport Transformation, Efficiency, Introduction to 3d transformations matrix, Matrix Representation of 3D Transformations, Transformations as a Change in Coordinate System.

UNIT – III

Representing Curves & Surfaces, Polygon Meshes, Parametric Cubic Curves, Quadric Surfaces.

Solid Modeling: Representing Solids, Regularized Boolean Set Operations, Primitive Instancing, Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry, Comparison of Representations, User Interfaces for Solid Modeling.

UNIT – IV

Introductory Concepts: Multimedia, Definition, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia

skills and training, Training Opportunities in Multimedia, Motivation for Multimedia usage.

Text Books:

1. Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles & Practice, 2000.
2. Ralf Skinmetz and Klana Naharstedt, "Multimedia: Computing, Communications and Applications", Pearson, 2001.

References Books:

1. D. Harn & Baker: Computer Graphics, Prentice Hall of India, 1986.
2. D. J. Gibbs & D. C. Tsichritzis: Multimedia Programming Object, Environment & Framework, 2000
3. Foley, J. D. & Van Dam, A: Fundamentals of Interactive Computer Graphics.
4. Rogers & Adams, "Mathematical Elements for Computer Graphics", McGraw Hill, 1989.
5. Tay Vaughan, "Multimedia: Making it Work", TMH, 2000.

BCA – 604

E – Commerce

External Marks: 70   Internal Marks: 30

UNIT – I

Introduction to E-Commerce: The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic Commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective.

Business Strategy in an Electronic Age: Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains, Competitive Strategy, Porter's Model, First Mover Advantage, Sustainable Competitive Advantage, Competitive Advantage using E-Commerce, Business, Introduction to Business Strategy, Strategic Implications, of IT,, Technology, Business, Environment, Business, Capability, Existing, Business, Strategy,, Strategy Formulation, & Implementation, Planning, E-Commerce, Implementation,, E-Commerce Evaluation.

UNIT – II

Business -to-Business Electronic Commerce: Characteristics of B2B EC, Models of B2B EC, Procurement Management Using the Buyer's Internal Marketplace, Supplier-Oriented Marketplace, Intermediary-Oriented Marketplace, Just-in-Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet-Based EDI, Integration with Back-end Information Systems, The Role of Software Agents for B2B EC, Electronic Marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: The Nuts and Bolts, EDI & Business.

Intranet and Extranet: Automotive Network Exchange, The Largest Extranet, Architecture of the Internet, Intranet, and Extranet, Intranet Software, Applications of Intranets, Intranet

Application Case Studies, Considerations in Intranet Deployment,, The Extranets, The Structure of Extranets, Extranet Products & Services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues.

UNIT – III

Electronic Payment Systems: Is SET a Failure, Electronic Payments & Protocols, Security Schemes in Electronic Payment Systems, Electronic Credit Card System on

the Internet, Electronic Fund Transfer and Debit Cards on the Internet, Stored-Valued Cards and E-Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

Public Policy: From Legal Issues to Privacy: EC-Related Legal Incidents, Legal, Ethical & Other Public Policy Issues, Protecting Privacy, Protecting Intellectual Property, Free Speech, Internet Indecency & Censorship, Taxation & Encryption Policies, Other Legal Issues: Contracts, Gambling & More, Consumer & Seller Protection in EC.

UNIT – IV

Infrastructure for EC: It takes more than Technology, A Network of Networks, Internet Protocols, Web-Based client/ Server, Internet Security, Selling on the Web, chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial issues.

Economics, Global & Other Issues in EC: Competition in Marketspace, Some Issues in Digital Economy and Success Factors, Impacts on Industry Structure, Intermediaries, and Others, virtual Communities, Global Electronic Commerce, Electronic Commerce in Small companies, Research in EC, The Future of EC.

Text Books:

1. David Whiteley, "E-Commerce", Tata McGraw Hill, 2000
2. Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson Education, 2000

BCA 605 – P

Practical – VI

External Marks: 35   Internal Marks: 15

Practical will be based on following Paper:

1. Computer Graphics & Multimedia Applications

BCA – 606

Major Project

External Marks: 70   Internal Marks: 30

Evaluation will be based on Summer Training held after fourth semester and will be conducted by the college committee only.

BCA – 607

Environmental Science

External Marks: 70   Internal Marks: 30

UNIT – I

General: Environmental segments, environmental degradation, environmental impact assessment. Concept of Ecosystem: Fundamental of Ecology and Ecosystem, components of ecosystem, food-chain, food-web, trophic levels, energy flow, cycling of nutrients, major ecosystem types (forest, grass land and aquatic ecosystem).

UNIT – II

Air Pollution: Atmospheric composition, energy balance, classification of air pollutants, source and effect of pollutants – Primary (CO, SOx, NOx, particulates, hydrocarbons), Secondary [photochemical smog, acid rain, ozone, PAN (Peroxy Acetyl Nitrate)], green house effect, ozone depletion, atmospheric stability and temperature inversion, Techniques used to control gaseous and particulate pollution, ambient air quality standards.

UNIT – III

Water Pollution: Hydrosphere, natural water, classification of water pollutants, trace element contamination of water, sources and effect of water pollution, types of pollutants, determination and significance of D.O., B.O.D., C.O.D. in waste water, Eutrophication, methods and equipment used in waste water treatment preliminary, secondary and tertiary.

UNIT – IV

Land Pollution & Noise Pollution: Lithosphere, pollutants (agricultural, industrial, urban waste, hazardous waste), their origin and effect, collection of solid waste, solid waste management, recycling and reuse of solid waste and their disposal techniques (open dumping, sanitary land filling, thermal, composting).
Noise Pollution: Sources, effect, standards and control.

UNIT – V

Environmental Biotechnology: Definition, current status of biotechnology in environmental protection, bio-fuels, bio-fertilize, bio-surfactants, bio-sensor, bio-

chips, bio-reactors.

Pollution Prevention through Biotechnology: Tannery industry, paper and pulp industry, pesticide industry, food and allied industry.

Text Books:

1. Environment and Ecology by Piyush Kant Pandey and Dipti Gupta (Sum India Publication).

2. A Textbook of Environmental Chemistry and Pollution Control by S. S. Dara (S. Chand and Company).

Reference Books:

1. Masters, G. M. Introduction to Environment Engineering and Science (Prentice Hall of India).

2. Environmental Chemistry by A. K. Dey (Eastern Ltd.).

3. Environmental Chemistry by B. K. Sharma (Krishna Prakashan).

4. Nebel B. J. Environmental Science (Prentice Hall of India-1987).

5. Environmental Biotechnology by S. N. Jogdand (Himalaya Publishing House).

6. Introduction to Environmental Biotechnology by A. K. Chatterji (Prentice Hall of India).