CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

ORDINANCES, REGULATIONS

&

SYLLABI

BACHELOR OF COMPUTER APPLICATIONS

(B.C.A.)

(1999-2000 and onwards)

FACULTY OF SCIENCE

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CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

ORDINANCES AND REGULATIONS

Relating to Degree Course

in

BACHELOR OF COMPUTER APPLICATIONS (B.C.A.)

1. The duration of Bachelor of Computer Applications Degree Course (B.C.A.) shall be Three Academic Years consisting of six semesters-two semesters in each Academic Year.

2. Each semester will be about ninety working days followed by an examination conducted by the University and a small term break/summer vacations.

3. Admission to B.C.A. Course is opened to a candidate who has passed Intermediate examination of the Board of High School and Intermediate Education U.P., Allahabad or an Examination recognized by the University as equivalent there-to with a minimium if 45% marks (33% in case of SC & ST candidates). Besides the Candidate must have taken Mathematics as one of the subjects at Intermediate level.

4. Admission to B.C.A. course will only be made in 1st semester. In no case direct admission will be made in second semester or subsequent semesters. The admission will be governed by the rules prescribed by the State Government/ University from time to time.

5. Ordinarily the examination for I, III and V Semesters will be held in the month of December and for II, IV and VI semesters in the month of April/May every year.

6. There will be no re-evaluation or supplementary examination in either of the semesters.

7. No candidate will get an opportunity of improvement of marks once he/she has passed an examination.

8. Medium of Instructions and Examinations will be English.

9. Student must put in a minimum of 75% attendance in every paper in each semester. A student who has not put in the required attendance in any course(s) shall not be allowed to take the examination in such course(s). He/she can do so only after acquiring the stipulated attendence by repeating the course. However, he/she will be allowed to proceed to the next semester.

10. The minimum pass marks (including internal assessment) shall be 40% in each paper and 50% in aggregate.

11. In the first five semesters the candidate will be declared only as "PASS" or "FAIL" or eligible for appearing in "Back-Paper". Division shall be awarded on the basis of combined result of all the six semesters.

12. Successful candidates shall be classified on the basis of combined results of six semesters as under :

    (i) 60% and above : First Division
    (ii) 50% and above but less than 60% : Second Division

    There will be no Third Division.

13. Candidate shall be allowed to use simple calculator during the examination wherever permitted by the paper setter.

14. The candidate shall be required to pass separately in Theory & Practical.

15. Following will be the rules for promotion :

    (i) If a candidate fails in upto not more than four papers in I and II Semesters (of each year) taken together, he/she will be permitted to appear in Back Paper and will be promoted provisionally to the next year.

    (ii) If a candidate fails in 5 to 6 papers in I and II Semesters taken together he/she will have to rejoin the course in Ist Semester.

    (iii) If a candidate fails in 7 or more papers he/she will not be allowed to continue and will be removed from roll of the College.

16. The minimum pass marks for passing Ist year (I & II Semesters taken together) shall be 40% in each theory paper and 40% in Practical seperately and 50% marks in aggregate.

17. The examination of back paper will be held along with the next corresponding semester examination. The maximum attempts allowed for passing a "Back Paper" will not be more than two in the subsequent examination.

18. A candidate allowed to appear in the Examination in any semester who has secured the minimum marks to pass in each paper, but has not secured the minimum marks to pass in aggregate may reappear in any of the two paper(s) of the Semester concerned according to his/her choice in order to secure the minimum marks prescribed to pass in the aggregate.

19. A candidate shall have to complete the course in a maximum duration of six years after his/her admission to first semester of the course.

20. All the paper setters/examiners shall ordinarly be external.

21. Each paper will be of three hours duration. The maximum marks allotted for each paper shall be as under :

    (i) Each Theory Paper shall be of 75 Marks
    (ii) Each Internal assessment shall be of 25 Marks

22. In respect of theory papers, 25 marks in each paper shall be reserved for the award in the Internal Assessment.

Guidelines for Internal Assessment :

(i) All assignment will be submitted by the student in his/her own hand-writting.

(ii) The distribution of marks of Internal Evaluation will be as follows :

(1)	Two written tests	=	15 marks
(2)	Class Assessment, Quizes & Seminars	=	10 marks
		Total	25 marks

(iii) The awards in the Internal Assessment in each paper in any semester must be submitted to the University before the commencement of the theory examination of that semester. In no case, a candidate will be allowed to appear in the end semester examination if his/her Internal Assessment Awards are not submitted to the University by the College before the commencement of the theory examiantion.

(iv) The candidate will be declared pass/fail on the basis of combined marks in the Internal Assessment and the marks in the end semester examination in any paper.

23. The grace marks shall be awarded as per the existing University Rules. However, no grace marks shall be awarded in the Project Work and in Practical Examination. The existing University rules for grace marks shall apply i.e. not more than Five marks shall be awarded in two courses for passing the semester examination. Upto three marks can be awarded as grace marks if the candidate is failing in aggregate or for improving his/her division.

24. There shall be Practical Examination in BCA in each semester and this shall be compulsory for all the students.

25. No student will be permitted to persue any other course of study alongwith this course.

26. Project Report will be evaluated and viva-voce there on will be conducted by the same set of examiners appointed by the University. The project report will carry 200 marks.

27. A candidate who has completed the prescribed attendance in all the subjects/ classes, but due to medical grounds could not appear in the internal assessment test and also could not appear in the semester examination of the concerned semester, can be considered as an ex-student and may be allowed to appear both in the internal test as well as in the semester examination.

CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

Curriculum and Scheme of Examination

for

B.C.A. Programme (Three Year Degree Course)

	L	T	P	Max Marks		T	Exam.
	(Per Week)			Sem. Exam	Sess. Exam.	O T A L	Dura. (Hrs.)
First Semester							
BCA-101 : Mathematics-I	5	1	—	75	25	100	3
BCA-102 : Discrete Mathematics	5	1	—	75	25	100	3
BCA-103 : Computer Fundamentals & Programming Concepts	5	1	—	75	25	100	3
BCA-104 : Principles of Management	5	1	—	75	25	100	3
BCA-105 : Practical Software Lab based on BCA-103	—	—	6	100	—	100	4
					Total	**500**	
Second Semester							
BCA-201 : Mathematics-II	5	1	—	75	25	100	3
BCA-202 : Data Structure and Programming with 'C'	5	1	—	75	25	100	3
BCA-203 : Data Base Management System	5	1	—	75	25	100	3
BCA-204 : Digital Electronics and Computer Organisation	5	1	—	75	25	100	3
BCA-205 : Practical Software Lab based on BCA-202 & BCA-203	—	—	6	100	—	100	4
					Total	**500**	
Third Semester							
BCA-301 : Computer Oriented Statistical & Optimization Methods	5	1	—	75	25	100	3
BCA-302 : Operating System	5	1	—	75	25	100	3
BCA-303 : Computer Architecture & Assembly Language	5	1	—	75	25	100	3
BCA-304 : Production & Operations Management	5	1	—	75	25	100	3
BCA-305 : Practical Software Lab based on BCA-302 & BCA-303	—	—	6	100		100	4
					Total	**500**	

L=Lectures; T=Tutorials; P=Practicals

	L	T	P	Max Marks		TOTAL	Exam. Dura. (Hrs.)
	(Per Week)			Sem. Exam	Sess. Exam.		
Fourth Semester							
BCA-401 : Computer Oriented Financial Management	5	1	—	75	25	100	3
BCA-402 : Computer Communication Networks	5	1	—	75	25	100	3
BCA-403 : Computer Graphics	5	1	—	75	25	100	3
BCA-404 : Object Oriented Programming and C++	5	1	—	75	25	100	3
BCA-405 : Practical Software Lab based on BCA-401, BCA-402, BCA-403 & BCA-404	—	—	6	100	—	100	4
					Total	**500**	
Fifth Semester							
BCA-501 : Software Engineering	5	1	—	75	25	100	3
BCA-502 : Programming in Visual Basic	5	1	—	75	25	100	3
BCA-503 : Information Systems : Analysis, Design and Implementation	5	1	—	75	25	100	3
BCA-504 : Technical Documentation, Presentation & Communication Skills	5	1	—	75	25	100	3
BCA-505 : Practical Software Lab based on BCA-502 & BCA-503	—	—	6	100	—	100	4
					Total	**500**	
Sixth Semester							
BCA-601 : Client Server Technology	5	1	—	75	25	100	3
BCA-602 : Multimedia and Its Applications	5	1	—	75	25	100	3
BCA-603 : Project Work-II	—	—	—	—	—	200	—
BCA-604 : Practical Software Lab based on BCA-601 & BCA-602	5	1	—	100	—	100	4
					Total	**500**	

CHAUDHARY CHARAN SINGH UNIVERSITY, MEERUT

SYLLABUS FOR BCA COURSE

FIRST SEMESTER

BCA-101 Mathematics-I

Differentiation and Partial differentiation of vector functions, Derivative of sum, dot product and cross product of two vectors, gradient, divergence and curl.

Straight lines; Circles and the system of circles; standard equations and properties of Parabola, Ellipse and Hyperbola. General equation of second degree in two variables, tracing of simple conic sections.

Successive differentiation, Leibnitz theorem, Partial differentiation, Euler's theorem, change of variables, Jacobian.

Integration of rational and irrational functions, Reduction formulae; Rectification, Quadrature, volumes and surfaces of Revolution, Some simple problems of double and tripple integrals.

Differential equations of first order, Differential equations of second order with constant coefficients.

Suggested Readings :

1. Engineering Mathematics : E. Kreyzig
2. Higher Engineering Mathematics : B.S. Grewal
3. Differential Calculus : Shanti Narayan

BCA-102 Discrete Mathematics

Mathematical Logic

Statements, Negation operation, Logic connectives and compound statements, conjunction, disjunction, Truth tables, Duality, conditional and in-conditional statements, valid arguments, Laws of detachments and syllogism, tautologics and fallacies.

Boolean Algebra :

Development of Boolean Algebra, Truth functions, AND, OR, NOT operators, Laws of Boolean Algebras, Reducing Boolean expressions, Bodean expressions and logic diagrams, Universal laws, Building blocks, Negative Logic Minterms, Truth tables and maps, Reduction of maps, Hybrid functions.

Graph Theory

Definition of a graph, finite and infinite graphs, Incidence and degree, null graph, Sub graphs, walks, Paths and circuits in a graph, connected graphs, Trees, Properties of Trees, cut sets and cut vertices, Planner graphs, Incidence Matrix, Directed graphs, Fundamental circuits in Diagraphs, Adjacency matrices of a diagraph.

Suggested Readings.

1. Elements of Discrete Mathematics (McGraw Hill) 1985 : C.L.Liu
2. Graph Theory with Applications to Engineering and Computer Science (PHI) 1993 : N. Deo
3. Discrete Mathematical structure for Computer Science (PHI) 1989 : B. Colman and Robert C. Busby
4. Graphs, Networks and Algorithms (Wiley Inter Science, NY) 1989. : M.N.S.Swamy and K. Thulasiraman

BCA-103 Computer Fundamentals and Programming Concepts

Computer Fundamentals : Number system : decimal, octal, binary and hexadecimal. Representation of integers, fixed and floating points, character representation : ASCII, EBSDIC.

Functional units of computer, I/O devices, primary and secondary memories.

Programming Fundamentals : Algorithm development, Techniques of problem solving, Flowcharting, Stepwise refinement, Algorithms for searching, Sorting (exchange and insertion), merging of ordered lists.

Programming in C : Representation of integers, characters, reals. Data types : constants and variables; Arithmetic Expression, Assignment statement, Logical expression, Sequencing, Alteration and iteration; Arrays, String processing; Sub programmes, Recursion, Files and Pointers Structured programming concepts; Top down Design, Development of efficient programs, Program Correctness; Debugging and testing of Programs.

BCA-104 Principles of Management

-Conceptual Framework of Management.

-Evolution and Foundation of Management Theories.

-Study of Management Processes.

Planning, Organising, Directing, Staffing, Communicating, Controlling, Coordinating.

-Types of Organisational Structures & Designs.

-Relevance of Computer Applications in Different Functional Areas of

Management Viz : Financial Management, Materials Managements, Production Management, Human Resources Management and Marketing Management.

Suggested Readings :

1. Management Principles & Practices : Parag Diwan & L.N. Agarwal
2. Organisational Behaviour : Fred Luthans
3. Principles & Practices of Management : L.M. Prasad.

BCA-105 Practical Software Lab based on BCA-103

SECOND SEMESTER

BCA-201 Mathematics-II

The real number system as a complete ordered field, neighbourhood, open and closed sets, limit points of sets.

Limits, continuity, sequential Continuity, algebra of Continuous functions, Continuity of composite functions, Contiuity on (a,b) implying boundedness.

Sequence, convergent sequence, Cauchy Sequence, monotonic sequence, Sub-sequence, Limit superior and limit inferior of sequences.

Infinite series, convergence of series, series of positive terms, comparision tests, Cauchy's n^{th} root test, D' Almberts ratio test, Raabe's test.

Alternating series and Maclaurin's series for sin x, cos x, log (1+x), $(1+x)^n$. Applications of mean value theorem to monotonic functions and inequalities. Maxima and minima; Indeterminant forms (applications of Maxima and Minima to simple Problems).

Suggested Readings :

1. Engineering Mathematics : E. Kreyzig
2. Higher Engineering Mathematics : B.S.Grewal
3. Differential Calculus : Shanti Narayan

BCA-202 Data Structure & Programming with 'C'

SECTION A

C-Language Programming :

(At least two questions are to be attempted out of four questions.)

Data types, I/O functions, Logical Operators, Control structures of C, conditional Statements, Switch Statement, Arrays, Pointers, Functions, Recursion, Structures & Unions, Operations on bits, File Handling & C Preprocessor.

SECTION B

Data Structure :

(At least two questions are to be attempted out of four questions.)

Introduction to Algorithm Design and Data Structure : Design & analysis of algorithm, Topdown and Bottom-up approaches to algorithm design, Analysis of algorithm, Frequency count, Complexity measures in terms of time and space.

Arrays, Stacks and Queues : Representation of array (single & multi dimensional arrays), Address calculation using column & row major ordering, Representation of stacks & Queues using arrays and their operations, circular queues, Applications of arrays, stacks & queues, Conversions from Infix to Postfix & prefix and evolution of prefix expressions using stack.

Linked list : Singly linked list (operations on list), Linked stacks and queues, polynominal representation and manipulation using linked list, Application : Reading and Writing polynomials, polynominal addition. Circular linked list and doubly linked list, Generalized list, Sparse matrix representation using generalized list structure.

Trees : Logical level of binary search tree, BST transversal methods (Preorder, Postorder and Inorder), Recursive and non-recursive algorithms for traverse methods, Insertion into and deletion from a BST and their implementation, preorder and postorder traversal, Insertion in Threaded tree, B-tree (Insertion and Deletion algorithms).

Searching and Sortings : Sequential and binary searches, Indexed search, Hashing schemes, Sorting methods (Insertion, selection, Bubble, Quick, Merge and Heap sorts).

Suggested Readings :

1. The C programming Language (PHI) 1990. : Kerighan and Ritchie
2. Data Structure and Program Design in "C" (PHI) 1998. : Kruse, Leung and Tondo
3. How to Program (Prentice Hall). 1996. : Deitel & Deitel - C
4. Fundamentals of Data Structures (Galgotia Publications). 1994. : Ellis Horowitz and Sartaj Sahni
5. Introduction to Data Structures and Algorithm Analysis with Pascal, 2nd Edition, (West Publishing Company). : Thomas L. Naps and G. J. Pothering
6. Algorithm + Data Structures = Programs (Prentice Hall). 1976. : N. Writh

BCA-203 DBMS (Data Base Management System)

Unit-I : Overview of Database Management System

1.1 Elements of Database system

1.2 DBMS and its architecture

1.3 Advantage of DBMS (including Data Independence)

1.4 Types of database users

1.5 Role of Database administrator

Unit-2 : Data Models

2.1 Brief overview of Hierarchial and Network Model

2.2 Detailed study of Relational Model (Relations, properties of Relational Model, key and Integritiy rules)

2.3 Comparison of Hierachial, Network and Relational Model

2.4 CODD's rules for Relational Model

2.5 E-R diagram

Unit-3 : Normalisation

3.1 Normalisation concepts and updatc anomalies

3.2 Functional dependencies

3.3 Multivalued and join dependencies

3.4 Normal Forms : (1NF, 2NF, 3NF, BCNF, 4NF, and 5NF)

Unit-4 : SQL

4.1 SQL constructs

4.2 SQL Join : Multiple table queries

4.3 Built-in functions

4.4 Views and their use

4.5 Overviews of ORACLE : (Data definition and manipulation)

Unit-5 : Database Security, Integrity and Control

5.1 Security and Integrity threats

5.2 Defense mechanism

5.3 Integrity

5.4 Auditing and control

5.5 Recent trends in DBMS-Distributed and Deductive Database

Suggested Readings :

1. An introduction to Database system : C.J. Data Vol. 1
2. An introduction to Database system : Bipin Desai

BCA-204 Digital Electronics and Computer Organization

Digital Electronics

(At least one question is to be attempted out of the given two questions)

Logic gates and circuits : Gates (OR, AND, NOR, NAND, XOR & XNOR) Demorgan's laws; Boolean laws, Circuit designing techniques (SOP, POS, K-Maps).

Combinational Building Blocks : Multiplexers; Decoders; Encoders; Adder and Substracter.

Sequential Building Blocks : Flip-flops (RS, D, JK, Master-slave & T flip-flops); Registers & shift registers; Counters : Synchronous and Asynchronous (Designing method).

Memories : ROMs, PROMs, EPROMs, RAMs, Hard Disk, Floppy Disk and CD-ROM.

Computer Organization :

(At least two questions are to be attempted out of the given five questions)

Central Processing Unit : Introduction, Register Organization; Stack Organization, Instruction format and Addressing modes.

Control Unit : Control memory; Horizontal and vertical formats; Address sequencer; Multiprogramming Vs Hardwired control; RISC Vs CISC.

Arithmetic Algorithms : Integer multiplication using shift and add, Booth's algorithm, Integer division, Floating point representations and arithmetic algorithms.

I/O Organization : Strobe based and handshake base communications; Vector and priority interrupt; DMA based data transfer.

Memory Organization : Basic cell of static and dynamic RAM; Building large memories using chips; Associative memory; Cache memory organization and Virtual memory organization.

Suggested Readings :

1. Digital Logic and Computer design (PHI). 1998. : M.M. Mano
2. Computer Architecture (PHI). 1998. : M.M. Mano
3. Digital Electronics (TMH). 1998. : Malvino and Leach
4. Computer Organization and Architecture (PHI). 1998. : William Stallings
5. Digital fundamentals (Universal Book Stall). 1998. : Floyd, L. Thomas
6. Computer Organization (Mc Graw-Hill, Singapore). : Hamcher, Vranesic and Zaky

BCA-205 Practical Software Lab based on BCA-202 & BCA-203

THIRD SEMESTER

BCA-301 Computer Oriented Statistical and Optimization Methods

Unit-I : Collection of Data, Sampling and Sampling Designs, Classification and Tabulation of Data, Graphical Representation of Data, Measures of Central value, Measures of Dispersion, Skewness, Moments and Kurtosis Correlation and Regression.

Unit-2 : Probability and Probability Distributions (Normal, Poisson's, Binomial)

Unit-3 : Linear Programming, Graphical Method, Simplex method (Simple application) Transportation Problems, Assignment Problems, Game theory.

Suggested Readings :

1. Probability and Statistical Inference : Hogg
2. Introduction to the Theory of Statistics : Alexander M.Mood, Franklin A Graybill, Dane C. Boes
3. Linear Programming : G. Hadley
4. Mathematical Planning Techniques : N. S. Kambo
5. Operations Research : Handy A. Taha

BCA-302 Operating Systems

Operating System as Resource Manager, Operating system classifications-simple monitor, multiprogramming, time sharing, Real time systems Multiprocessor systems, Operating system services.

File Systems : File supports. access methods. allocation methods-contiguous linked and index allocation; Directory systems-single level, tree-structured, a cyclic graph and general graph directory, file protection.

CPU Scheduling : Basic scheduling concepts, Process overviews, process states, multiprogramming, Schedulers and scheduling algorithms, multiple-processor scheduling.

Memory Management : Bare machine approach, Resident monitor, Partition, paging and segmentation, virtual memory, demand paging.

Deadlocks : Deadlock characterization, Deadlock prevention, avoidance detection and recovery.

Resource Protection : Mechanisms, policies and domain of protection, Access matrix and its implementation, dynamic protection structures.

Case study of the Windows-NT : Design principle; System components; Environment subsystem; File System; Programmer interface.

Sggested Readings :

1. Operating system Concepts (Addison-Wesley Publishing Company) 3rd Edn., 1998 : Peterson & Silberschatz
2. Operating Systems (Mc-Graw Hill Book Comp.) 1996. : Madnick & Donovan
3. Modern Operating systems (PHI) 1998. : Tanenbaum, A.S.
4. Operating Systems-A Design Approach (TMH). 1997. : Growley, Charles

BCA-303 Computer Architecture and Assembly Language

Basic computer organisation and design. Instructions and instruction codes. Timing and control/instruction cycle. Registers/types of registers/general purpose and special purpose registers/index registers. Register transfer and micro-operations/Register transfer instructions. Memory and memory function. Bus/data transfer instructions. Arithmetic logic micro-operations/shift micro-operations. Input/output and interrupts. Memory reference instructions. Memory interfacing/cache memory and cache controllers.

Central Processing Unit : General register organisation, stack organisation, instruction formats, addressing modes, data transfer and manipulation. Program control. Reduced set computer, pipeline and vector processing, parallel processing, pipe lining, arithmetic pipeline/RISC pipeline vector processing/array processing.

Computer Arithmetic : Addition, subtraction and multiplication alogrithms, division algorithms. Floating point arithmetic operations, decimal arithmetic operations.

Input-Output Organisation : Peripheral devices. Input-Output interface, ALU Asynchronous Data transfer, mode of transfer, priority interrupts, Direct Memory Address (DMA). Input-Output processor (IOP), serial communication.

Evaluation of Microprocessor : Overview of intel 8085 to intel propentium processors. Basic microprocessor architecture and interface, internal architecture, external architecture, memory and input/output interface.

Assembly Language, Assemblers, Assembly level instructions, macros, use of macros, in I/O instructions, program loops, programming arithmetic and logic, subroutines, Input-Output programming.

Suggested Readings :

1. Introduction to Microprocessors, Prentice Hall of India. : Leventhal, L.A.

2. Introduction to Microprocessors, Tata McGraw Hill. : Mathur, A.P.
3. Prospective in Computer Architecture, Prentice Hall of India. : Rao, P.V.S.

BCA-304 Production and Operations Management

1. Introduction to operations systems
2. Historical Evolution of Operations Management.
3. New Product Development.
4. Product Design & Service Design.
5. Technology Development Process and Technology Selection.
6. Capacity Planning.
7. Process Selection, Product-process Strategy
8. Facilities Location
9. Layout Design
10. Production Planning and Control
11. Aggregate Planning
12. Introduction to Materials Management, Materials Requirement Planning Systems.
13. Application of JIT
14. Statistical Quality Control (SQC), Quality Assurance, Acceptance Sampling & Total Quality Management (TQM)
15. Case Studies on various topics.

Suggested Readings :

1. Modern Production/Operations Management : Buffa & Sarin.
2. Production & Operations Management : Ada & Ebert.
3. Production & Operations Management : Chase & Aquilano.
4. Principles of Operations Management : Render & Heizer.

BCA-305 Practical Software Lab based on BCA-302 & BCA-303

FOURTH SEMESTER

BCA-401 Computer Oriented Financial Management

1. **Introduction to Accounting**
   - -Meaning of accounting.
   - -Advantage of accounting.
   - -Uses of Financial Statements.
   - -Double entry system of Financial Accounting.
   - -Generally accepted accounting Principles.
   - -Concepts underlying profit & loss accounts, balance sheet.
2. **Accounting Mechanics**
   - -Cash Book
   - -Special Journals
   - -Rules of Debit and Credit
   - -General Ledger
   - -Bank Reconciliation Statement
3. **Preparation of Financial Statement**
   - -Preparation of Trial Balance
   - -Reconciliation of Trial Balance
   - -Preparation of Financial Statements (Including Adjustments)
4. Familiarity with and use of Standard Accounting Package (Ex-Tally)
5. Capital Budgeting : Basic Principles and Techniques.
6. Working capital Management : An over all view.
7. **Capital Structure : Planning & Analysis**
   - -Ratio Analysis
   - -Fund flow statement.
   - -Cash flow statement

Suggested Readings :

1. Book Keeping : T.S. Grewal
2. Financial Management : Prasanna Chandra
3. Ex-Tally Accounting package : —

BCA-402 Computer Communication Networks

Introduction : Uses of networks (goals and applications), OSI reference model, Example Network-Novell Netware, ARPNET, NSFNET, The Internet.

The Physical Layer : Transmission media : Twisted pair, Baseband and Broadband coaxial cable, Fiber optics; Wireless Transmission : Radio transmission, Microwave transmission, Infrared and light wave transmission; ISDN services; Virtual Circuits verses circuit Switching, Transmission in ATM Networks, Paging Systems, Cordless Telephones, Cellular telephones; Communication Satellite.

The Data Link Layer : Framing, Error control, Flow control; Error detection and Correction; Protocols : Simplex stop and wait protocols, One bit sliding window, Using Go-Back n, Example : The Data Link Layer in the Internet.

The Medium Access Sub Layer : Framing Static and Dynamic Channel Allocation in LANS and MANs; IEEE standard 802.3 and Ethernet; IEEE standard 802.4 and Token Bus, IEEE 802.4 and token Ring; Bridges; Bridges from 802 x to 802 y, Transparent Bridges, Source Routing Bridges.

The Network Layer : Network layer design issues, shortest path routing, Flooding, Flow based routine, Broadcast routine, Congestion control and prevention policies; Internet working; connectionless Internet working, Tunneling Internet work Routing, Fragmentation, Firewalls, IP protocols, IP address, Internet control protocols.

The Transportation Layer : The transport service; Transport protocols : Addressing, Establishing and releasing a connection; The internet transport protocols : TCP.

The Application Layer : Network Security, Electronic mail.

Suggested Readings :

1. Computer Networks, (PHI), 1980 : Tanenbaum, A.S.
2. Data and Computer Communication, Prentice Hall of India, 1995 : Stallings, W.
3. Computer Communication Networks and ISDN Systems, Khanna publishers, New Delhi, 1995. : Aggarwal R.B.

BCA-403 Computer Graphics

Development of computer graphics, basic graphics system and standards. Raster scan and Random scan graphics, continual refresh and storages displays, display processors and character generators. Colour display techniques, frame buffer and Bitbit operations concepts in raster graphics.

Points/lines and curves/scan conversion/line drawing algorithms/circle and ellipse generation/polygon filling/conic-section generation, anitiliasing.

Two-dimensional viewing, basic transformations, coordinate systems, windowing and clipping, segments, interactive picture construction techniques, interactive input/output devices.

Three-dimensional concepts, 3-D representation and transformations, 3-D viewing, algorithms for 3-D volumes, Spline curves and surfaces, Fractals, Quadtree and Octree data structures.

Hidden lines and surfaces, Rendering and Animation.

Suggested Readings :

1. Principles of Interactive Computer Graphics 1981. : Newman, W.M. and Spraull, R.F.

BCA-404 Object Oriented Programming and C++

Object-Oriented Analysis and Data Modeling : Object Oriented Concepts, Object oriented Analysis Modeling, Data Modeling.

Object-Oriented Design : Origins of object-Oriented Design, Object Oriented design concepts, Object Oriented Design methods, class and object definition, Refining Operations, Program Components and Interfaces, Annotation for object-oriented Design, Implementation of Detail Design, An alternative object-oriented Design Strategy, Integrating OOD with SA/SD

Introduction to OOP and C++ : Advantages of OOP, Need of object-oriented programming, characteristics of object-oriented languages, C++ and C.

C++ Programming Basics : Basic program construction; input/output using cin/count; Preprocessor Directives; Comments; integer, character, float data types manipulators Arithmetic operators; Library functions.

Loops and Decisions : Relational operators, Loops, Decisions, Logical Operators, Precedence, Control statements.

Structure and Functions : Structure, Enumerated Data Types, simple functions, Passing arguments to and returning values from functions, Reference Arguments, Overloaded functions, Inline functions, Default Arguments, Variables and storage classes, Returning by reference.

Objects and classes : specifying & using class & object, Constructors, objects as function arguments.

Arrays and Operator Overloading : Array Fundamentals, Arrays as class member data, Arrays of objects, strings, overloading Unray & Binary operators, Data conversion, Pitfalls of overloading & Coversion.

Inheritance : Derived class and their constructs, overriding member functions, class hierarchies, Public & Private Inheritance, Inheritance levels.

Pointers : Pointers with Arrays, functions, strings, pointer to objects, new-delete, Linked-Lists Virtual Functions, files and Streams : Virtual, friend and static functions; the this pointer; streams; string, character, object I/O;I/O with Multiple Objects; File pointers; Disk I/O with member function; Error Handling; Redirection; command-line Arguments.

Suggested Readings :

1. The Waite's Group Object Oriented Programming using C++ (Gałgotia Publications) 1994 : Lafore, Rober S.
2. Software Engineering, A Practitioner's Approach- (McGraw Hill book Co.) Internationa! Edition 1992. : Pressman. Rogers S.
3. Object Oriented Programming in C++ (Prentice Hall of India) 1996 : Barkakati, Nabajoti
4. Object Oriented Software Construction (Prentice Hall Englewood cliffs). 1990 : Meyer, B.

BCA-405 Practical Software Lab based on BCA-401, BCA-402, BCA-403 & BCA-404

BCA-504 Technical Documentation, Presentation & Communication Skills

TECHNICAL DOCUMENTATION PRESENTATION

-Accuracy & Conciseness in Technical English.

-Structure Format etc. for Technical Reports & Thesis

-Comparing & Contracting other aspects of short reports & long dissertations.

COMMUNICATION SKILLS

Communication Process : Concept & importance

System of communication : Formal & internal, Barrier to effective communication.

Principles of business communication : Planning & conduct, conversations. interview & Discussion. The preparation of oral statements, effective listening, telephonic communication.

Written Communication : guides to effective writing for business correspondence including letters and job application. Memorandum, Office orders, Reports.

Non-Verbal Communication : Importance and Type-cluster and congruency. Kinetics Vocal Cues.

Modern Forms of Communication : Telex, Fax, Telegram Teleconferencing & E-mail.

Practical in Business Communication : Report writing, Public Speaking, Seminars, Presentation, Interview, Group Discussion, Effective Listening.

BCA-505 Practical Software Lab based on BCA-502 & BCA-503

SIXTH SEMESTER

BCA-601 Client Server Technology

Client-Server technology and its uses, historical development, client-server technology and heterogeneous computing, Distributed Computing, computing plateforms, Microprocessor Integration and client server computing, implementations and scalability. Fundamentals of client server design, division of labour, Transition to client-server programming; Interaction of client and server communication Techniques and protocols, implementing client server applications, multitasking with Process and threads.

Scheduling implmentations, schedular internals, Preemplive Vs non-preemplive systems; synchronization-understanding and using remaphores, semaphore implementation in Novall Netware, windows NT and UNIX; Memory-management, Allocation, Sharing and manipulating.

Client server computing with ORACLE-Overview of DBMS, client server relationships, ORACLE and client server computing, using SQL with SQL *DBA, the ORACLE tools and design aids, SQL windows & Power Builder.

Suggested Readings :

1. Novell's Guide to client-server Applications and Architecture (BPB Public. 1994) : Jaffrey D. Schank
2. Client/Server Computing with ORACLE (BPB publications 1994) : Salemi
3. Client/Server Computing (PHI) 1998) : Smith and Guengerich
4. Client/Server Computing (Mc Graw-Hill, International) : Dewire
5. Client/Server Architecture (Mc Graw-Hill, Internatinal) : Bessen
6. Building Client Server Networks (TMH, 1997) : Bay Arinze
7. Power Builder : a guide for Developing Client/Server Applications (Mc Graw-Hill International, 1998) : Banbara & Allen
8. Client/Server System Design and implementation (Mc Graw Hill International 1997) : Vaughn
9. Mastering ORACLE 7 & Client/Server Computing (TMH 1998) : Bobrowski

BCA-602 Multimedia and Its Applications

Introduction and Hardware : Definition of Multimedia, CD-ROMs and Multimedia applications, Multimedia requirements-Hardware, Software, Creativity and organization, Multimedia skills and training Macintosh verses PC, the Macintosh platform, PC platform, Connections, Memory and storage devices, Input devices, Output hardware, Communication devices.

Multimedia Software : Basic tools, painting and drawing tools, OCR software, Sound editing programs, Animation devices and digital movies and other accessories, Linking multimedia objects, office suites, word processor, spreadsheets presentation tools, Types of Authoring toolscard and page based, Icon based and time based authoring tools, Object oriented tools.

Production Building Blocks : Text-using text in Multimedia, Computers and Text, Font editing and Design tools, Hyper media and Hyper text, Sounds-multimedia system sounds MIDI verses Digital Audio, Audio file formates, Working with sound in Windows, Notation interchange file format (NIFF), Adding sound.

Production Tips : Image-creation, making still images, images colors, Image; File format, Animation-principles of animation, making workable animations Video, using video, Broadcast video, standard, Integrating Computer and TVs, shooting and editing Video, using Recording formats, Video tips, Video Compression.

Multimedia Project Development and Case Studies : Project planning, Estimating, RPFs and Bid proposals, Desining, Producing acquiring and using contents, Using Telnet, Testing, Preparing for delivery, CD-ROM Technology and Standards.

Designing for the Word Wide, working on the Web, Text for the Web, Images for the Web, Sound for the Web, Animation for the Web.

Suggested Readings :

1. Multimedia Making It Work (TMH) 1997. : Tay Vaughan
2. Multimedia Power Tools, 2 Edition (Random House Electronic Publishing). : Peter Jerram and M. Gosney

BCA-603 Project Work-II

BCA-604 Practical Software Lab based on BCA-601 & BCA-602