U.P. TECHNICAL UNIVERSITY LUCKNOW

Syllabus

For

1st and 2nd Year

OF

MASTER OF COMPUTER APPLICATIONS

(DUAL DEGREE COURSE)

Study and Evaluation Scheme
MCA Dual Degree Course
Semester–I (Effective from the session: 2013-14)

S.No	Code	Subject	Periods L T P			Evaluation Scheme Sessional Semester CT TA TOT P				End Th P		Total	Credit
			L	T	P	CT	TA	TOT	P	Th	P		
1.	NBC 101	Mathematics -I	3	1	0	30	20	50	-	100	-	150	4
2.	NBC 102	Computer Fundamentals	3	1	0	30	20	50	-	100	-	150	4
3.	NBC 103	Digital Electronics	3	1	0	30	20	50	-	100	-	150	4
4.	NBC 104	Oral and Written Communication	2	0	0	-	-	-	-	50	-	50	2
5.	NBC 105	Computer Concepts and Programming in C	3	1	3	30	20	50	50	100	50	250	6
6.	NBC 106	Office Automation	3	1	3	30	20	50	50	100	50	250	6
TOTAL Marks:			**17**	**5**	**6**							**1000**	**26**

L: Lecture   T: Tutorial   P: Practical/Project   CT: Class Test   TA: Teacher's Assessment
Th: Theory   TOT: Total

TA=20 (10 for Teachers assessment plus 10 for attendance)

P=50 (15 marks for practical exam, 15 marks viva. 10 marks for lab records and 10 marks for quiz)

Study and Evaluation Scheme
MCA Dual Degree Course
Semester –II (Effective from the session: 2013-14)

S.No	Code	Subject	Periods L T P			Evaluation Scheme Sessional				End Semester		Total	Credit
			L	T	P	CT	TA	TOT	P	Th	P		
1.	NBC 201	Mathematics -II	3	1	0	30	20	50	-	100	-	150	4
2.	NBC 202	Data Structures Using C	3	1	3	30	20	50	50	100	50	250	6
3.	NBC 203	Operating System	3	1	0	30	20	50	-	100	-	150	4
4.	NBC 204	Computer Organization	3	1	0	30	20	50	-	100	-	150	4
5.	NBC 205	Professional Communication	3	1	3	30	20	50	50	100	50	250	6
6.	NBC 206	Principles of Management	2	0	0	-	-	-	-	50	-	50	2
TOTAL Marks:			**17**	**5**	**6**							**1000**	**26**

L: Lecture   T: Tutorial   P: Practical/Project   CT: Class Test   TA: Teacher's Assessment
Th: Theory   TOT: Total

TA=20 (10 for Teachers assessment plus 10 for attendance)

P=50 (15 marks for practical exam, 15 marks viva. 10 marks for lab records and 10 marks for quiz)

Study and Evaluation Scheme
MCA Dual Degree Course
Semester–III (Effective from the session: 2014-15)

S. No	Code	Subject	Periods L T P			Evaluation Scheme Sessional Semester CT	TA	TOT	P	End Th	P	Total	Credit
1.	NBC 301	Introduction to Web Designing	3	1	3	30	20	50	50	100	50	250	6
2.	NBC 302	DBMS – I	3	1	3	30	20	50	50	100	50	250	6
3.	NBC 303	Management Information System	3	1	0	30	20	50	-	100	-	150	4
4.	NBC 304	Business Communication	3	1	0	30	20	50	-	100	-	150	4
5.	NBC 305	Discrete Mathematics	3	1	0	30	20	50	-	100	-	150	4
6.	AUC-001/ AUC-002	*Human Value & Professional Ethics/ Cyber Security*	2	0	0	15	10	25		50		75*	
7.	NGP 301	General Proficiency	0	0	0				50			50	2
TOTAL Marks:			15	5	6							1000	26

L: Lecture   T: Tutorial   P: Practical/Project   CT: Class Test   TA:Teacher's Assessment
Th: Theory   TOT: Total

TA=20 (10 for Teachers assessment plus 10 for attendance)

P=50 (15 marks for practical exam, 15 marks viva. 10 marks for lab records and 10 marks for quiz)

*Human values & Professional Ethics /Cyber Security will be offered as a compulsory audit course for which passing marks are 30% in End Semester Examination and 40% in aggregate.

Study and Evaluation Scheme
MCA Dual Degree Course
Semester –IV (Effective from the session: 2014-15)

S. No	Code	Subject	Periods L T P			Evaluation Scheme Sessional				End Semester		Total	Credit
			L	T	P	CT	TA	TOT	P	Th	P		
1.	NBC 401	Computer Based Numerical & Statistical Techniques	3	1	3	30	20	50	50	100	50	250	6
2.	NBC 402	Object Oriented Programming using C++	3	1	3	30	20	50	50	100	50	250	6
3.	NBC 403	Fundamental of E-Commerce	3	1	0	30	20	50	-	100	-	150	4
4.	NBC 404	Computer Networks	3	1	0	30	20	50	-	100	-	150	4
5.	NBC 405	Software Engineering	3	1	0	30	20	50	-	100	-	150	4
6.	AUC-002/ AUC-001	*Cyber Security /Human Value & Professional Ethics*	2	0	0	15	10	25		50		75*	
7.	NGP 401	General Proficiency	0	0	0	-	-	-	50	50	-	50	2
TOTAL Marks:			**15**	**5**	**6**							**1000**	**26**

*L: Lecture   T: Tutorial   P: Practical/Project   CT: Class Test   TA:Teacher's Assessment
Th: Theory   TOT: Total*

TA=20 (10 for Teachers assessment plus 10 for attendance)

P=50 (15 marks for practical exam, 15 marks viva. 10 marks for lab records and 10 marks for quiz)

*Human values & Professional Ethics /Cyber Security will be offered as a compulsory audit course for which passing marks are 30% in End Semester Examination and 40% in aggregate.

NBC- 101 MATHEMATICS-I
Course Contents

Unit I: Differential Calculus - I

Leibnitz's theorem, Partial derivatives, Euler's theorem for homogeneous functions, Total derivatives, Change of variables, Curve tracing: Cartesian and Polar coordinates.

Unit II: Differential Calculus - II

Taylor's and Maclaurin's Theorems, Expansion of function of several variables, Jacobian, Approximation of errors, Extrema of functions of several variables, Lagrange's method of multipliers (Simple applications).

Unit III: Linear Algebra

Inverse of a matrix by elementary transformations, Rank of a matrix (Echelon & Normal form), Linear dependence, Consistency of linear system of equations and their solution, Characteristic equation, Eigen values and eigen vectors, Cayley-Hamilton Theorem, A brief introduction to Vector Spaces, Subspaces. Rank & Nullity. Linear transformations.

Unit IV: Multiple Integrals

Double and triple integrals, Change of order of integration, Change of variables, Application of integration to lengths, Volumes and Surface areas – Cartesian and Polar coordinates. Beta and Gamma functions, Dirichlet's integral and applications.

Unit V: Vector Calculus

Point function, Gradient, Divergence and Curl and their physical interpretations, Vector identities, Directional derivatives. Line, Surface and Volume integrals, Applications of Green's, Stoke's and Gauss divergence theorems (without proofs),

Reference Books:
1. E. Kreyszig :Advanced Engineering Mathematics-Volume-I, John Wiley & Sons
2. B. V. Ramana, Higher Engineering Mathematics, Tata Mc Graw- Hill Publishing Company Ltd.
3. R.K.Jain & S.R.K. Iyenger, Advance Engineering Mathematics, Narosa Publishing House.
4. B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers.
5. Peter V. O' Neil, Advanced Engineering Mathematics, Thomas (Cengage) Learning.
6. Thomas & Finley, Calculus, Narosa Publishing House

7. Rukmangadachari Engineering Mathematics-II, Pearson Education.

NBC- 102 COMPUTER FUNDAMENTALS
Course Contents

Unit I:

What is computer, characteristics of computer, generation of computers, classification of computers. Hardware: (a) Input devices -keyboard, printing devices, voice speech devices, scanner, MICR, OMR, Bar code reader, digital camera etc. (b) Output devices -Visual Display Unit, printers, plotters etc.(c) Software: Introduction; Types of software with examples; Introduction to languages, compiler, interpreter and assembler.

Unit II:

Memory unit : Primary memory-RAM, ROM, PROM, EPROM, EEPROM, Secondary memory, Cache memory, Virtual memory. Storage Devices –Magnetic disk, Magnetic tape, Optical disks-CD, DVD, Pen drive, Hard disk, Floppy disk, Flash Memory etc.

Unit III:

Operating System: Definition, Functions, Types and Classification, Elements of GUI based operating system- Windows- Use of menus, tools and commands of windows operating system. Computer Network : Overview of Computer Network, Types of computer networks (LAN, WAN and MAN), Network topologies.

Unit IV:

Internet: Overview of Internet, Architecture & Functioning of Internet, Basic services over Internet like WWW, FTP, Telnet, Gopher etc., IP addresses, ISPs, URL, Domain names, Web Browsers, Internet Protocols, Search engines, e-mail, Web browsing, searching, downloading & uploading from Internet. Applications of Information Technology.

Unit V:

Problem solving concept: Problem solving techniques (Trail & Error, Brain Storming, Divide & Conquer) Steps in problem solving (Define Problem, Analyze Problem, Explore Solution) Algorithms and Flowcharts (Definitions, Symbols), Characteristics of an algorithm Conditions in pseudo-code, Loops in pseudo code. Time complexity: Big-Oh notation, efficiency. Simple Examples: Algorithms and flowcharts.

Reference Books:
1. Computer Fundamentals By P K Sinha Forth Edition

2. Computer Fundamentals By: P. Rajaraman

3. Computer Today By Suresh Basandra

4. Shrivastava- Fundamental of Computer& Information Systems (Wiley Dreamtech)

5. Leon A and Leon M -Introduction to Computers (Vikas, 1st Edition).

6. Introduction to Computers, Norton P.(TATA McGraw Hill)

7. Leon -Fundamentals of Information Technology, (Vikas)

8. Peter Norton's Introduction to Computers – Tata MGHill

NBC- 103 DIGITAL ELECTRONICS
Course Contents

Unit I:

Digital computers and Digital systems, Number systems : Binary number system, Octal & Hexa-decimal number system, Conversion of Number System, Complements: r's and (r-1)'s complement, Signed Binary numbers, Binary codes, Arithmetic operations on Binary numbers.

Unit II:

Logic Gates: AND, OR, NOT GATES and their Truth tables, NOR, NAND & XOR gates. Boolean Algebra: Law's, Postulates and theorems, Universal building blocks, logic diagrams, Converting circuits to universal logic, Minimization techniques: K -Map, Sum of Product & Product of Sum, Tabulation method.

Unit III:

Combinational circuits: Adders, Subtractors, Binary parallel adders, Adder/Subtractor, Decimal adder, Code conversion, Magnitude comparator, Multiplexers, Demultiplexers, Decoders & Encoders.

Unit IV:

Flip-flops: Types of Flip Flop: R-S, D, J-K, T, Master Slave, Triggering of flip-flops, state reduction and assignment, Conversion of flip-flops and State Realization of one Flip Flop Using Other Flip Flop.

Unit V:

Registers and Counters Shift Registers, types of registers, Universal Shift Register with parallel load, Bi-directional Shift register, Ripple counters, synchronous counters, Ring counters, Johnson counter, Mod counters.

Reference Books:

1. Morris Mano, *Digital Logic and Computer Design*, Prentice Hall of India.
2. Morris Mano, *Digital Design*, Prentice Hall of India.
3. R.K. Gaur, *Digital Electronics and Microcomputer*, Dhanpat Rai Publication
4. R.P. Jain, *Modern Digital Electronics*, Tata McGraw-Hill
5. Malvino & Leach, *Digital Principles and Applications*, Tata McGraw-Hill.
6. Rajaraman & Radhakrishanan, *An introduction to Digital Computer Design,* Prentice Hall of India.

NBC- 104 ORAL AND WRITTEN COMMUNICATION
Course Contents:

Unit I:

Basic Applied Grammar and Usage The Sentences; Kinds of Sentences; Kinds of Phrases;

Parts of Speech: Noun: Kinds, Gender; Case; Usage: Rules for Singular Nouns, Nouns in Plural form but Singular in sense etc. Nouns ending in - ics. Nouns ending in - es etc; Pronoun: Definition, Kinds; Number, Gender, Person, Usage. Adjectives and Determiners: kinds, Position; Comparatives and Superlatives, Conversion of Adjectives as Nouns, as adverbs, as Verbs. Determiners- Kinds. Usage of Adjectives and Determiners. Articles: Kinds, Articles and Number System, Articles and Gender System, Omission of Articles, Repetition of Articles. Adverbs: Kinds; Formation, Position of Adverbs, Degree of Comparison, Usage. Preposition: Kinds, Prepositions and Adverbial Participles, Position; correct Usage, Meaning & Usage. Verbs: Kinds; Auxiliaries; Principal Auxiliaries: Usage; Be, Have, Do, Modal auxiliaries: Usage- Can/Could, May/Might; Must; Shall/Should; Will/Would; Ought to, Semi-Modals- Need; Dare; Used to. Non-Finite Verbs: Kinds of Non-Finite: Infinitives, Gerund; Participle. Concord: Of Numbers, Of Person. Exceptions to Grammatical; Concord; Concord System. Conjunction: Coordinating Conjunction; Subordinating Conjunction. Interjection: Definition, Types. Mood: Indicative, Imperative, Subjunctive. Active and Passive Voice. Conditional Sentences.

Unit II:

The Structure of Sentences/Clauses Adverb Clause; Adjective Clause; Noun Clause. Sentences: Simple, Double, Multiple and Complex. Transformation of Sentences: Simple to

complex and vice versa. Transformation of Reader simple to Compound and vice versa; Interrogative into Assertive; Affirmative into Negative and vice versa: Transformation of Statement into Exclamation. Sequence of Tenses: Usage.

Unit III:

Paragraph Writing Structure of Paragraph; Construction of Paragraph; Techniques of Paragraph Writing, Unity; Coherence; Emphasis. Expansion: Definition, Method of Expansion; Making of Expansion. Paraphrasing : Use of Paraphrasing; Exercises.

Unit IV:

Comprehension & Precis Writing Role of Listening; Ear Training, Reading Comprehension; Reasons for poor Comprehension; Improving Comprehension Skills; Developing Skills of Comprehension; Exercises. Precis Writing: Difference from Comprehension; Techniques of Precis Writing; Topic Sentences and its Arrangement. Short Essay Writing Definition of Essay; Types of Essay, Relevant Essay Writing for Engineers/Professionals; Use of Essay Writing, Dimensions of Essay Writing : Literary, Scientific, Sociological: Contemporary Problem Solving Essays. Horizons of Essay Writing: Narrative Essays; Descriptive Essays; Reflective Essays; Expository Essays; Argumentative and Imaginative Essays. Exercise.

Reference Books:

1. A Remedial Course in English for Colleges Books 1-3 by B.K. Das & A. David, Oxford Univ. Press, New Delhi.
2. Current English Grammar and Usage with composition by R.P. Sinha, Oxford Univ. Press, New Delhi.
3. English Grammar, Composition and Usage by J.C. Nesfield, Macmillan India Ltd. Delhi.
4. Oxford Practice Grammar by John Eastwood, Oxford Univ. Press, New Delhi.
5. Fowler's Modem English Usage by R.W. Burchfield, O.U.P. New Delhi.
6. English Grammar & Composition by P.C. Wren & Martin, S. Chand & Co. Ltd., New Delhi.

NBC- 105 COMPUTER CONCEPTS AND PROGRAMMING IN C
Course Contents

UNIT I:

Introduction to any Operating System [Unix, Linux, Windows], Programming Environment, Write and execute the first program, Introduction to the Digital Computer; Concept of an algorithm; Termination and correctness. Algorithms to programs: Specification, top-down development and stepwise refinement. Introduction to Programming, Use of high level

programming language for the systematic development of programs. Introduction to the design and implementation of correct, Efficient and maintainable programs, Structured Programming, Trace an algorithm to depict the logic, Number Systems and conversion methods

UNIT II:
Standard I/O in "C", Fundamental Data Types and Storage Classes: Character types, Integer, short, long, unsigned, single and double-precision floating point, storage classes, automatic, register, static and external, Operators and Expressions: Using numeric and relational operators, mixed operands and type conversion, Logical operators, Bit operations, Operator precedence and associativity,

UNIT III:
Conditional Program Execution: Applying if and switch statements, nesting if and else, restrictions on switch values, use of break and default with switch, Program Loops and Iteration: Uses of while, do and for loops, multiple loop variables, assignment operators, using break and continue, Modular Programming: Passing arguments by value, scope rules and global variables, separate compilation, and linkage, building your own modules.

UNIT IV:
Arrays: Array notation and representation, manipulating array elements, using multidimensional arrays, arrays of unknown or varying size, Structures: Purpose and usage of structures, declaring structures, assigning of structures, Pointers to Objects: Pointer and address arithmetic, pointer operations and declarations, using pointers as function arguments, Dynamic memory allocation, defining and using stacks and linked lists.

UNIT V:
Sequential search, Sorting arrays, Strings, Text files, The Standard C Preprocessor: Defining and calling macros, utilizing conditional compilation, passing values to the compiler, The Standard C Library: Input/Output : fopen, fread, etc, string handling functions, Math functions : log, sine, like Other Standard C functions.

Reference Books:
1. Problem Solving and Program Design in C, by Jeri R. Hanly, Elliot B. Koffman, Pearson Addison-Wesley, 2006.
2. Computer Science- A Structured Programming Approach Using C, by Behrouz A. Forouzan, Richard F. Gilberg, Thomson, Third Edition [India Edition], 2007.

NBC- 106 OFFICE AUTOMATION
Course Contents

Unit I:

Introduction to Microsoft office, Overview of the office component, MS-Office files and Folders, Opening, and saving files, Notepad, WordPad, Paint. MS-Office Shortcut Bar, Windows Task Bar.

Unit II:

MS-WORD - Starting MS WORD, Creating and Formatting a document, Changing fonts and point size, Table Creation and operations, Autocorrect, Auto-text, Spell Check, Word Art, Working with Header, Footers, and Footnotes, Working with Graphics, Inserting objects, Page setup, Page Preview, Printing a document, Mail Merge, Outline, Find, and Automatic features, Creating Macros and Customizing word.

Unit III:

MS-Excel - Starting Excel, Worksheet, Rearranging Worksheet and Cell, Inserting Data into Rows/Columns, Alignment, Text wrapping, Sorting data, Excel formatting tips and Techniques, Generating graphs, Organizing large project. Introduction to Functions, Excels chart features, Excels command macros, using worksheet as Database.

Unit IV:

MS-Power Point - Starting MS–Power Point, Creating a presentation using Auto-content Wizard, Blank Presentation, Creating, Saving and Printing a presentation, Adding a slide to presentation, Navigating through a presentation, Slide-sorter, Slide-show, Editing slides, Working with Graphics and Multimedia in PowerPoint (Inserting Photo, Video & Sound).

Unit V:

MS-Access-Introduction to Access, Creating Tables and Database, Data Type and Properties, Adding & Deleting Field in Table, Primary Key Fields, Queries, Forms: The Forms wizard saving forms, Modifying forms, Pages, Macro, Module, Reports, Printing Report, Forms, Letter, Relation Database, Graphics in Database, Linking Importing and Exporting Records. Internet-Use of Internet (Mailing, Browsing, Surfing)

Reference Books:

1. MS-Office 2000(For Windows) – By Gini Courter, Annette Marquis, BPB Publishing.

2. Working in Microsoft Office – Ron Mansfield, Tate McGraw Hill Publishing.

3. MS-Office 2000(For Windows) – By Steve Sagman.

4. Bill Bruck., The Essentials Office 2000 Book, BPB Publishing.

5. Joyce Cox & Polly Urban, Microsoft Office, Galgotia Publishing

NBC- 105P COMPUTER CONCEPTS AND PROGRAMMING IN C LAB
Course Contents

Suggested Assignments to be conducted on a 3-hour slot. It will be conducted in tandem with the theory course so the topics for problems given in the lab are already initiated in the theory class. The topics taught in the theory course should be appropriately be sequenced for synchronization with the laboratory. A sample sequence of topics and lab classes for the topic are given below:

1. Familiarization of a computer and the environment and execution of sample programs

2. Expression evaluation

3. Conditionals and branching

4. Iteration

5. Functions

6. Recursion

7. Arrays

8. Structures

9. Linked lists

10. Data structures

NBC- 106P OFFICE AUTOMATION LAB
Course Contents

MS-WORD: Creating, Editing, Formatting: Font name, size, color, alignment, changing, paragraph settings, change case, Mail Marge, Creating Tables, editing tables, alignment settings in tables.

MS-EXCEL: Creating, Editing, Formatting: font name, size, color, alignment, changing, entering data, Sorting Data, Inserting, renaming and deleting Sheet, Inserting row, column, cell, picture, background, graph, symbol, hyperlink ,object, diagram.

MS-POWERPOINT: Creating, Editing, Formatting: font name, size, color, alignment, changing, Inserting table, picture, background, graph, symbol, hyperlink, object, diagram.

MS-ACCESS: Creating database and editing data base.

Semester II

NBC- 201 MATHEMATICS-II
Course Contents

Unit I:

Differential Equations: Linear differential equations of nth order with constant coefficients, Complementary functions and particular integrals, Simultaneous linear differential equations, Solution of second order differential equation by changing dependent and independent variables, Method of variation of parameters, Applications to engineering problems (without derivation).

Unit II:

Series Solution and Special Functions: Series solution of ordinary differential equations of 2nd order with variable coefficients (Frobenius Method), Bessel and Legendre equations and their series solutions, Properties of Bessel functions and Legendre polynomials.

Unit III:

Laplace Transform: Laplace transform, Existence theorem, Laplace transform of derivatives and integrals, Inverse Laplace transform, Unit step function , Dirac delta function, Laplace transform of periodic functions, Convolution theorem, Application to solve simple linear and simultaneous differential equations.

Unit IV:

Fourier Series and Partial Differential Equations: Periodic functions, Trignometric series, Fourier series of period 2 , Eulers formulae, Functions having arbitrary period, Change of interval, Even and odd functions, Half range sine and cosine series, Harmonic analysis. Solution of first order Lagrange's linear partial differential equatins, Linear partial differential equations with constant coefficients of 2nd order and their classifications - parabolic, elliptic and hyperbolic with illustrative examples.

Unit V:

Applications of Partial Differential Equations: Method of separation of variables for solving partial differential equations, Wave equation up to two-dimensions, Laplace equation in two-dimensions, Heat conduction equations up to two-dimensions, Equations of transmission lines.

Reference Books:

1. B.V.Ramana, Higher Engineering Mathmatics, Tata Mc Graw-Hill Publishing Company Ltd., 2008.

2. R.K.Jain & S.R.K.Iyenger, Advance Engineering Mathematics, Narosa Publishing House, 2002.

3. B.S.Grewal, Engineering Mathematics, Khanna Publishers, 2004.

4. B.S.Grewal, Higher Engineering Mathematics, Khanna Publishers, 2005.

5. E.Kreyszig, Advanced Engineering Mathematics, John Wiley & Sons, 2005.

6. C.Ray Wylie & Louis C. Barrett, Advanced Engineering Mathematics, Tata Mc Graw-Hill Publishing Company Ltd. 2003.

7. Peter V. O'Neil, Advanced Engineering Mathematics, Thomson (Cengage) Learning, 2007.

8. G.F.Simmons, Differential Euations, Tata Mc Graw-Hill Publishing Company Ltd. 1981.

9. Chandrika Prasad, Advanced Mathematic for Engineers, Prasad Mudranalaya,1996.

NBC- 202 DATA STRUCTURES USING 'C'
Course Contents

Unit I:

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices, and Vectors. Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion: Recursive definition and processes, recursion in C, example of recursion, Tower of Hanoi Problem, simulating recursion. Backtracking, recursive algorithms, principles of recursion, tail recursion, removal of recursion.

Unit II:

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque, and Priority Queue, Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List in Array,

Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

Unit III:

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Traversing Threaded Binary trees, Huffman algorithm. Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

Unit IV:

Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting. Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

Unit V:

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees. File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons.

Reference Books:

1. Y. Langsam, M. Augenstin and A. Tannenbaum, Data Structures using C and C++, Pearson Education Asia, 2nd Edition, 2002.
2. Ellis Horowitz, S. Sahni, D. Mehta Fundamentals of Data Structures in C++, Galgotia Book Source, New Delhi.
3. S. Lipschutz, Data Structures Mc-Graw Hill International Editions, 1986.
4. Jean-Paul Tremblay, Paul. G. Soresan, An introduction todata structures with Applications, Tata Mc-Graw Hill International Editions, 2nd edition 1984.
5. A. Michael Berman, Data structures via C++, Oxford University Press, 2002.
6.   M. Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education, 2002, 2nd edition.

NBC- 203 OPERATING SYSTEMS
Course Contents

Unit I:

Introduction: Definition and types of operating systems, Batch Systems, multi programming, time–sharing parallel, distributed and real-time systems, Operating system structure, Operating system components and services, System calls, system programs, Virtual machines.

Unit II:

Process Management: Process concept, Process scheduling, Cooperating processes, Threads, Interprocess communication, CPU scheduling criteria, Scheduling algorithms, Multiple-processor scheduling, Real-time scheduling and Algorithm evaluation.

Unit III:

Process Synchronization and Deadlocks: The Critical-Section problem, synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, Monitors, Deadlocks-System model, Characterization, Deadlock prevention, Avoidance and Detection, Recovery from deadlock, Combined approach to deadlock handling.

Unit IV:

Storage management: Memory Management-Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with paging in MULTICS and Intel 386, Virtual Memory, Demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrasing, Page Size and other considerations, Demand segmentation, File systems, secondary Storage Structure, File concept, access methods, directory implementation, Efficiency and performance, recovery, Disk structure, Disk scheduling methods, Disk management, Recovery, Disk structure, disk scheduling methods, Disk management, Swap-Space management, Disk reliability.

Unit V:

Security & Case Study: Protection and Security-Goals of protection, Domain of protection, Access matrix, Implementation of access Matrix, Revocation of Access Rights, language based protection, The Security problem, Authentication, One Time passwords, Program threats, System threats, Threat Monitoring, Encryption. Windows NT-Design principles, System components, Environmental subsystems, File system, Networking and program interface, Linux system-design principles, Kernel Modules, Process Management, Scheduling,

Memory management, File Systems, Input and output, Interprocess communication, Network structure, security

Reference Books:

1. Abraham Siberschatz and Peter Baer Galvin, "Operating System Concepts", Fifth Edition, Addision-Wesley

2. Milan Milankovic, "Operating Systems, Concepts and Design", McGraw-Hill.

3. Harvey M Deital, "Operating Systems", Addison Wesley

4. Richard Peterson, "Linux: The Complete Reference", Osborne McGraw-Hill

NBC- 204 COMPUTER ORGANIZATION
Course Contents

Unit I:

Register Transfer Language, Bus and Memory Transfers, Bus Architecture, Arithmetic Logic, Shift Microoperation, Arithmetic Logic Shift Unit, Design of Fast adders, Arithmetic Algorithms (addition, subtraction, Booth Multiplication).

Unit II:

Control Design: Hardwired & Micro Programmed (Control Unit): Fundamental Concepts (Register Transfers, Performing of arithmetic or logical operations, Fetching a word from memory, storing a word in memory), Execution of a complete instruction, Multiple-Bus organization, Hardwired Control, Micro programmed control(Microinstruction, Microprogram sequencing, Wide-Branch addressing, Microinstruction with Next-address field, Prefetching Microinstruction).

Unit III:

Processor Design: Processor Organization: General register organization, Stack organization, Addressing mode, Instruction format, Data transfer & manipulations, Program Control, Reduced Instruction Set Computer.

Unit IV:

Input-Output Organization: I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Direct Memory access, Input-Output processor, Serial Communication.

Memory Organization: Memory Hierarchy, Main Memory (RAM and ROM Chips), Auxiliary memory, Cache memory, Virtual Memory, Memory management hardware.

Reference Books:

1. Computer System Architecture, M. Mano (PHI)
2. Computer Organization, Vravice, Zaky & Hamacher (TMH Publication)
3. Structured Computer Organization, Tannenbaum (PHI)
4. Computer Organization, Stallings (PHI)
5. Computer Organization, John P. Hayes (McGraw Hill)

NBC- 205 PROFESSIONAL COMMUNICATION
Course Contents

Unit I:

Basics of Technical Communication Technical Communication: features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; The flow of communication: Downward, Upward, Lateral or Horizontal (Peer group); Importance of technical communication; Barriers to Communication.

Unit II:

Constituents of Technical Written Communication Words and Phrases: Word formation. Synonyms and Antonyms; Homophones; Select vocabulary of about 500-1000 New words; Requisites of Sentence Construction: Paragraph Development: Techniques and Methods - Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation- various steps.

Unit III:

Forms of Technical Communication Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order, Claim and Adjustment Letters; Job application and Resumes. Official Letters: D.O. Letters; Govt. Letters, Letters to Authorities etc. Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance. Technical Paper, Project. Dissertation and Thesis Writing: Features, Methods & Writing.

Presentation Strategies Defining Purpose; Audience & Locale; Organizing Contents; Preparing Outline; Audio-visual Aids; Nuances of Delivery; Body Language; Space; Setting Nuances of Voice Dynamics; Time- Dimension.

Unit V:

Value- Based Text Readings Following essays form the suggested text book with emphasis on Mechanics of writing,

(i) The Aims of Science and the Humanities by M.E. Prior

(ii) The Language of Literature and Science by A.Huxley

(iii) Man and Nature by J.Bronowski

(iv) The Mother of the Sciences by A.J. Bahm

(v) Science and Survival by Barry Commoner

(vi) Humanistic and Scientific Approaches to Human Activity by Moody E. Prior

(vii) The Effect of Scientific Temper on Man by Bertrand Russell.

Reference Books:

1. Improve Your Writing ed. V.N. Arora and Laxmi Chandra, Oxford Univ. Press, New Delhi .

NBC- 206 PRINCIPLES OF MANAGEMENT
Course Contents

Unit I:

Management: Concept, Nature, Importance; Management : Art and Science, Management As a Profession, Management Vs. Administration, Management Skills, Levels of Management, Characteristics of Quality Managers. Evolution of Management: Early contributions, Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach, Decision Theory Approach. Business Ethics and Social Responsibility: Concept, Shift to Ethics, Tools of Ethics.

Unit II:

Introduction to Functions of Management Planning: Nature, Scope, Objectives and Significance of Planning, Types of Planning, Process of Planning, Barriers to Effective Planning, Planning Premises and Forecasting, Key to Planning, Decision Making. Organizing: Concept, Organisation Theories, Forms of Organisational Structure, Combining Jobs:

Departmentation, Span Authority & Responsibility, Organisational Design.

Unit III:

Staffing: Concept, System Approach, Manpower Planning, Job Design, Recruitment & Selection, Training & Development, Performance Appraisal Directing: Concept, Direction and Supervision Motivation: Concept, Motivation and Performance, Theories Of Motivation, Approaches for Improving Motivation, Pay and Job Performance, Quality of Work Life, Morale Building.

Unit IV:

Leadership: The Core of Leadership: Influence, Functions of Leaders, Leadership Style, Leadership Development. Communication: Communication Process, Importance of Communication, Communication Channels, Barriers to Communication. Controlling: Concept, Types of Control, Methods: Pre-control: Concurrent Control: Post-control, An Integrated Control System, The Quality Concept Factors affecting Quality, Developing a Quality Control System, Total Quality Control, Pre-control of Inputs, Concurrent Control of Operations. Post Control of Outputs. Change and Development: Model for Managing Change, Forces for Change, Need for Change, Alternative Change Techniques, New Trends in Organisational Change.

Reference Books:

1. Stoner, Freeman & Gilbert Jr-Management (Prentice Hall of India, 6th Edition).
2. Koontz -Principles of Management (Tata Mc Graw Hill, Ist Edition 2008).
3. Robbins & Coulter - Management (Prentice Hall of India, 8th Edition).
4. Robbins S.P. and Decenzo David A. - Fundamentals of Management: Essential Concepts and Applications (Pearson Education, 5th Edition).
5. Hillier Frederick S. and Hillier Mark S. - Introduction to Management Science: A Modeling and Case Studies Approach with Spreadsheets (Tata Mc Graw Hill, 2nd Edition 2008).
6. Weihrich Heinz and Koontz Harold - Management: A Global and Entrepreneurial Perspective (Mc Graw Hill, 12th Edition 2008).

NBC- 202P DATA STRUCTURES USING C LAB
Course Contents

Write Program in C for following:

- Sorting programs: Bubble sort, Merge sort, Insertion sort, Selection sort, and Quick sort.
- Searching programs: Linear Search, Binary Search.
- Array implementation of Stack, Queue, Circular Queue, Linked List.
- Implementation of Stack, Queue, Circular Queue, Linked List using dynamic memory allocation.
- Implementation of Binary tree.
- Program for Tree Traversals (preorder, inorder, postorder).
- Program for graph traversal (BFS, DFS).
- Program for minimum cost spanning tree, shortest path.

NBC- 205P PROFESSIONL COMMUNICATION LAB
Course Contents

Interactive and Communicative Practical with emphasis on Oral Presentation/Spoken Communication based on International Phonetic Alphabets (I.P.A.)

LIST OF PRACTICALS

1. Group Discussion: Practical based on Accurate and Current Grammatical Patterns.

2. Conversational Skills for Interviews under suitable Professional Communication Lab conditions with emphasis on Kinesics.

3. Communication Skills for Seminars/Conferences/Workshops with emphasis on Paralinguistics/Kinesics.

4. Presentation Skills for Technical Paper/Project Reports/ Professional Reports based on proper Stress and Intonation Mechanics.

5. Official/Public Speaking based on suitable Rhythmic Patterns.

6. Theme- Presentation/ Key-Note Presentation based on correct argumentation methodologies.

7. Individual Speech Delivery/Conferences with skills to defend Interjections/Quizzes.

8. Argumentative Skills/Role Play Presentation with Stress and Intonation.

9. Comprehension Skills based on Reading and Listening Practicals on a model Audio-Visual Usage.

Reference Books:

1. Sethi & Dhamija: A Course in Phonetics and Spoken English, Prentice Hall, New Delhi.

2. L.U.B.Pandey & R.P.Singh, A Manual of Practical Communication, A.I.T.B.S. Pub. India Ltd. Krishan Nagar, Delhi.

3. Joans Daniel, English Pronouncing Dictionary, Cambridge Univ. Press.

NBC 301 : INTRODUCTION TO WEB DESIGNING

UNIT I

Networking Concepts : Network - Importance of Network - Parts of the Network - Types of Network - Network Topology - Protocols - Types of protocols - Methods used for transmission - Network cables.

UNIT II

Internet : Introduction - Brief history of Internet - Working of Internet - Applications of Internet : Application in Business sector, Application in Education sector - Requirements for Internet - using Internet - Popular terms of Internet - How to open Internet Explorer - Parts of Internet Explorer.

UNIT III

Introduction to HTML : What is HTML ? - Evolution of HTML - Features of HTML - Filenames in HTML - Tools required - What are Tags ? - Types of tags - Attributes - Comments - Structures of HTML tag - Rules for writing a HTML program - starting a HTML document : How to open Notepad - How to open HTML page - Editing the HTML program.

UNIT IV

Formatting in HTML: Introduction - Formatting tags -
 tag, <p> tag, <HR> tag - Text formatting tags : <B> tag, <I> tag, <U> tag, <BIG> tag, <SMALL> tag - The <BODY> tag : Background, Bgcolor, Link, Text attributes - The Heading tag - The <marquee> tag.

The <FONT> tag : color, face, size attributes - The <IMG> tag : Alt, Align, Height and width attributes, Border attributes - Anchor tag : Creating links in HTML - Lists : Types of Lists - Table : Table - Table size- Alignment and Spacing - Frames in HTML - Attributes of <FRAMESET> tag - <FRAME> tag.

UNIT V

Introduction to DHTML and CSS**. XML:** Introduction ,transition from HTML to XML,DTD, XML schemas, building blocks of XML document, creating elements, creating attributes, creating entities.

Text-Books:
1.   Ivan Bayross, " Web Enabled Commercial Application Development using.HTML,DHTML,JavaScript,Perl, CGI", BPB.
2.   Scott Robert Ladd, "Dynamic HTML complete", McGrawHill.
3.   David Busch, "Cascating Style Sheets complete", McGrawHill.
4.   A Navarro, "Mastering XML", BPB

UNIT-I

Introduction: Characteristics of database approach, data models, database users, database schema, DBMS architecture and data independence, DBMS structure.

UNIT-II

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.

EER and ER to relational mapping: Data base design using EER to relational language.

UNIT-III

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

UNIT-IV

Relational Data Model: Relational model concepts, relational constraints, relational algebra

SQL: SQL queries, programming using SQL.

UNIT-V

Database 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

References

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.
3.   A.K.Majumdar, P. Bhattacharya, "Database Management Systems", TMH, 1996.
4.   Bipin Desai, "An Introduction to database systems", Galgotia Publications, 1991.

NBC 303 : MANAGEMENT INFORMATION SYSTEMS
Unit I
Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, Solving business problems with information systems, Types of information systems, Effectiveness and efficiency criteria in information system.
Unit II
An overview of Management Information Systems: Definition of a management information system, MIS versus Data processing, MIS & Decision Support Systems, Concept of an MIS, Structure of a Management information system.
Unit III
Concepts of planning & control: Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization.
Unit IV
Business applications of information technology: Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage.
Unit V
Managing Information Technology: Enterprise & global management, Security & Ethical challenges, Planning & Implementing changes, CRM, SCM.
Text Books
1. O Brian, "Management Information System", TMH
2. Gordon B. Davis & Margrethe H. Olson, "Management Information System", TMH.
References
1. O Brian, "Introduction to Information System", MCGRAW HILL.
2. Murdick, "Information System for Modern Management", PHI.
3. Jawadekar, " Management Information System", TMH.
4. Jain Sarika, "Information System", PPM
5. Davis, "Information System", Palgrave Macmillan

NBC 304 : BUSINESS COMMUNICATION

UNIT-I

Means of Communication: Meaning and Definition – Process – Functions – Objectives – Importance – Essentials of good communication – Communication barriers, 7C's of Communication.

UNIT-II

Types of Communication: Oral Communication: Meaning, nature and scope – Principle of effective oral communication – Techniques of effective speech – Media of oral communication (Face -to-face conversation – Teleconferences – Press Conference – Demonstration – Radio Recording – Dictaphone – Meetings – Rumour – Demonstration and Dramatisation – Public address system – Grapevine – Group Discussion – Oral report – Closed circuit TV). The art of listening – Principles of good listening.

UNIT-III

Written Communication: Purpose of writing, Clarity in Writing, Pricinciple of Effective writing, Writing Techniques, Electronic Writing Process.

UNIT-IV

Business Letters & Reports: Need and functions of business letters – Planning & layout of business letter – Kinds of business letters – Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports.

UNIT-V

Drafting of business letters: Enquiries and replies – Placing and fulfilling orders – Complaints and follow-up Sales letters – Circular letters Application for employment and resume.

Referential Books :

1. Business Communication – K.K.Sinha – Galgotia Publishing Company, New Delhi.
2. Essentials of Business Communication – Rajendra Pal and J.S. Korlhalli- Sultan chand & Sons, New Delhi.
3. Business Communication (Principles, Methods and Techniques) Nirmal Singh – Deep & Deep Publications Pvt. Ltd., New Delhi.
4. Business Correspondence and Report Writing – R.C. Sharma, Krishna Mohan – Tata McGraw-Hill Publishing Company Limited, New Delhi.
5. Communicate to Win – Richard Denny – Kogan Page India Private Limited, New Delhi.
6. Modern Business Correspondence – L.Gartside – The English Language Book Society and Macdonald and Evans Ltd.
7. Business Communication – M.Balasubrahmanyan –Vani Education Books.
8. Creating a Successful CV –Siman Howard – Dorling Kidersley.

NBC 305 : DISCRETE MATHEMATICS

UNIT-I

Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets.

Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, equivalence relation, partial ordering relation.

Function: Definition, type of functions, one to one, into and onto function, inverse function, composition of functions, recursively defined functions.

UNIT-II

Mathematical Induction: Piano's axioms, Mathematical Induction Discrete Numeric Functions and Generating functions Simple Recurrence relation with constant coefficients, Linear recurrence relation without constant coefficients.

UNIT-III

Algebraic Structures: Properties, Semi group, Monoid, Group, Abelian group, properties of group, Subgroup, Cyclic group, Cosets, Permutation groups, Homomorphism, Isomorphism and Automorphism of groups

UNIT-IV

Propositional Logic: Preposition, First order logic, Basic logical operations, Tautologies, Contradictions, Algebra of Proposition, Logical implication, Logical equivalence, Normal forms,Inference Theory, Predicates and quantifiers,

UNIT-V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, and complemented lattices.

Text Books:

1) Trembley, J.P & R. Manohar, "Discrete Mathematical Structure with Application to Computer Science", TMH

Reference Books :

2) Chowdhary, K. R. " Fundamentals of discrete Mathematical Structures', Second Edition, PHI Learning
3) Liptschutz, Seymour, "Discrete Mathematics", TMH
4) Kenneth H. Rosen, " Discrete Mathematics and its applications", TMH

NBC 401 : COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES

Unit-I

Floating point Arithmetic: Representation of floating point numbers, Operations, Normalization, Pitfalls of floating point representation. Errors in numerical computation.

Iterative Methods: Zeros of a single transcendental equation and zeros of polynomial using Bisection Method, Iteration Method, Regula-Falsi method, Newton Raphson method, Secant method, Rate of convergence of iterative methods.

Unit-II

Finite differences and Interpolation: Finite Differences, Difference tables. Polynomial Interpolation: Newton's forward and backward formula Central Difference Formulae: Gauss forward and backward formula, Sterling's, Bessel's, Everett's formula. Lagrange's Interpolation, Newton Divided difference formula, Hermit's Interpolation for unequal intervals.

Unit-III

Numerical Differentiation and Integration: Introduction, Numerical Differentiation, Numerical Integration, Trapezoidal rule, Simpson's rules, Boole's Rule, Weddle's Rule Euler-Maclaurin Formula.

Unit-IV

Simultaneous Linear Equations: Solutions of system of Linear equations, Gauss Elimination direct method and pivoting, Ill Conditioned system of equations, Refinement of solution. Gauss Jacobi and Gauss Seidel iterative methods, Rate of Convergence.

Solution of differential equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta methods, Predictor-corrector methods.

Unit-V

Curve fitting, Approximations and Regression Analysis: Method of least squares, fitting of straight lines, polynomials, exponential curves etc. Approximation of functions by Chebyshev polynomials. Linear, Non-linear and Multiple regressions.

Statistical methods: Sample distributions, Test of Significance: Chi-Square Test, t and F test.

Text Books:
1.   Rajaraman V., "Computer Oriented Numerical Methods", PHI
2.   Gerald & Wheatley, "Applied Numerical Analyses", AW

References:
1.   Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", New Age Int.
2.   Gupta S.P. and Kapoor, V.K., Fundamentals of Applied statistics, Sultan Chand & Sons.
3.   Gupta S.P. and Kapoor, V.K., Fundamentals of Mathematical Statistics, Sultan Chand and Sons.

NBC 402 : OBJECT ORIENTED PROGRAMMING USING C++
UNIT-I

Introduction: Introducing Object – Oriented Approach, Relating to other paradigms {Functional, Data decomposition}.

Basic concepts: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.

UNIT-II

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State idendity and behaviour 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, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parameteric Polymorphism

UNIT-IV

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

UNIT-V

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

Referential 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.The C programming Lang., Person Ecl – Dennis Ritchie
3. R.Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004.
4. E. Balagurusamy, "Object Oriented Programming with C++", TMH

References:

1.. Herbert Sehlidt, "The Complete Reference c++", TMH.
2. Schaum's Outline, Programming with C++, TMH.

NBC 403 : FOUNDAMENTALS OF E-COMMERCE

Unit I

Introduction: Electronic Commerce - Technology and Prospects, Definition of E- Commerce, Economic potential of electronic commerce, Incentives for engaging in electronic commerce, forces behind E-Commerce, Advantages and Disadvantages, Architectural framework, Impact of E-commerce on business.

Unit II

Mobile Commerce: Introduction, Wireless Application Protocol, WAP technology, Mobile Information device, Mobile Computing Applications.

Unit III

Web Security: Security Issues on web, Importance of Firewall, components of Firewall, Transaction security, Emerging client server, Security Threats, Network Security.

Unit IV

Encryption: Encryption techniques, Symmetric Encryption- Keys and data encryption standard, Asymmetric encryption- Secret key encryption, public and private pair key encryption, Digital Signatures, Virtual Private Network.

Unit V

Electronic Payments: Overview, The SET protocol, Payment Gateway, certificate, digital Tokens, Smart card, credit card, magnetic strip card, E-Checks, Credit/Debit card based EPS, online Banking. EDI Application in business, E- Commerce Law, Forms of Agreement, Govt. policies and Agenda.

References

1.   Ravi Kalakota, Andrew Winston, "Frontiers of Electronic Commerce", Addison Wesley.
2.   Bajaj and Nag, "E-Commerce the cutting edge of Business", TMH
3.   P. Loshin, John Vacca, "Electronic commerce", Firewall Media, New Delhi

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.

UNIT-II

Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon capacity, comparison of media.

UNIT-III

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.

Point to point controls: Transmission states, PPP layers, LCP, Authentication, NCP. **ISDN:** Services, Historical outline, subscriber's access, ISDN Layers and broadcast ISDN.

UNIT-IV

Devices: Repeaters, bridges, gateways, routers, The Network Layer; Design issues, Routing algorithms, Congestion control Algorithms, Quality of service, Internetworking, Network-Layer in the internet.

UNIT-V

Transport and upper layers in OSI Model: Transport layer functions, connection management, functions of session layers, presentation layer and application layer.

Referential Books:

1.   A.S.Tanenbaum, "Computer Networks"; Pearson Education Asia, 4th Ed. 2003.
2.   Behrouz A.Forouzan, "Data Communication and Networking", 3rd Ed. Tata McGraw Hill, 2004.
3.   William stallings, "Data and computer communications", Pearson education Asia, 7th Ed., 2002.

NBC 405 : SOFTWARE ENGINEERING

Unit-I

Introduction: Introduction to Software Engineering, Software Components, Software Characteristics, Software Crisis, Software Engineering Processes, Similarity and Differences from Conventional Engineering Processes, Software Quality Attributes. Software Development Life Cycle (SDLC) Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models.

Unit-II

Software Requirement Specifications (SRS): Requirement Engineering Process: Elicitation, Analysis, Documentation, Review and Management of User Needs, Feasibility Study, Information Modelling, Data Flow Diagrams, Entity Relationship Diagrams, Decision Tables, SRS Document, IEEE Standards for SRS.

Unit-III

Software Design: Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization, Design Structure Charts, Pseudo Codes, Flow Charts, Coupling and Cohesion Measures, Design Strategies: Function Oriented Design, Object Oriented Design, Top-Down and Bottom-Up Design.

Unit-IV

Software Testing and Maintenance: Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Top-Down and Bottom-Up Testing Strategies: Test Drivers and Test Stubs, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Test Data Suit Preparation, Alpha and Beta Testing.

Need for Maintenance, Categories of Maintenance: Preventive, Corrective and Perfective Maintenance, Cost of Maintenance, Software Re-Engineering, Reverse Engineering.

Unit-V

Software Project Management and Other Software Engineering methodologies: Software Configuration Management Activities, Change Control Process, Software Version Control, An Overview of CASE Tools. Estimation of Various Parameters such as Cost, Efforts, Schedule/Duration, Constructive Cost Models (COCOMO), Resource Allocation Models, Software Risk Analysis and Management.

Text books

1. R. S. Pressman, Software Engineering: A Practitioners Approach, McGraw Hill.
2. K. K. Aggarwal and Yogesh Singh, Software Engineering, New Age International Publishers.
3. Pankaj Jalote, Software Engineering, Wiley

Reference books

1. Rajib Mall, Fundamentals of Software Engineering, PHI Publication.
2. Jibitesh Mishra and Ashok Mohanty, Software Engineering : Pearson