

HINDUSTAN UNIVERSITY

B.C.A (Bachelor of Computer Applications)

CURRICULUM - 2012 FULL-TIME

SEMESTER I

Code no	Course Title	L	T	P	C	TCH
THEORY						
EL1105	English -1	4	0	0	4	4
BMA111	Applied Mathematics -1	4	1	0	4	5
BC1101	Computer Concepts & Problem Solving	3	0	0	3	3
BC1102	Digital Logic and Fundamentals	3	0	0	3	3
BC1103	Programming in C	3	0	0	3	3
PRACTICALS						
BC1121	Digital Laboratory	0	0	3	1	3
BC1122	Computer Concepts and Problem Solving Laboratory	0	0	3	1	3
BC1123	C Programming Laboratory	0	0	3	1	3
	TOTAL	17	1	9	20	27

SEMESTER II

Code no	Course Title	L	T	P	C	TCH
THEORY						
EL1106	English -II	4	0	0	4	4
BMA121	Calculus and Matrices	4	1	0	4	5
BC1201	Data Structures	3	0	0	3	3
BC1202	Microprocessors and its applications	3	0	0	3	3
BC1203	Introduction to Accounting	4	1	0	3	5
PRACTICALS						
BC1221	Data Structures Laboratory	0	0	3	1	3
BC1222	Microprocessors Lab	0	0	3	1	3
BC1223	Accounting Laboratory	0	0	3	1	3
	TOTAL	18	2	9	20	29

SEMESTER III

Code no	Course Title	L	T	P	C	TCH
THEORY						
BMA213	Business Statistics	4	1	0	4	5
BC1301	Algorithm Design Techniques	3	0	0	3	3
BC1302	Software Engineering	4	0	0	4	4
BC1303	Object Oriented Programming	4	1	0	4	5
BC1304	Computer Architecture	4	0	0	3	4
PRACTICALS						
BC1321	Object Oriented Programming Laboratory	0	0	3	1	3
BC1322	Algorithm Design Laboratory	0	0	3	1	3
BC1323	Software Engineering Lab	0	0	3	1	3
	TOTAL	19	2	9	21	30

SEMESTER IV

Code no	Course Title	L	T	P	C	TCH
THEORY						
BMA222	Discrete Mathematics	3	1	0	4	4
BC1401	Operating Systems	3	0	0	3	3
BC1402	Computer Networks	3	0	2	4	5
BC1403	Database Management Systems	3	0	0	3	3
BC1404	Computer Graphics	3	0	0	3	3
PRACTICALS						
BC1421	Operating Systems Lab	0	0	3	1	3
BC1422	RDBMS Laboratory	0	0	3	1	3
BC1423	Computer Graphics Laboratory	0	0	3	1	3
	TOTAL	15	1	11	20	27

SEMESTER V

Code no	Course Title	L	T	P	C	TCH
THEORY						
BC1501	Multimedia Systems	3	0	0	3	3
BC1502	Internet Programming	3	1	0	4	4
BC1503	Compiler Design	3	1	0	4	4
-----	E1 Elective – I	3	0	0	3	3
-----	E2 Elective – II	3	0	0	3	3
PRACTICALS						
BC1521	Multimedia Systems Lab	0	0	3	1	3
BC1522	Internet Programming Lab	0	0	3	1	3
BC1523	Compiler Design Lab	0	0	3	1	3
	TOTAL	15	2	9	20	26

SEMESTER VI

CODE NO	Course Title	L	T	P	C	TCH
THEORY						
BC1601	Cryptography and Network Security	3	0	0	3	3
BC1602	Data Warehousing and Data Mining	3	0	2	4	5
-----	E3 Elective – III	3	0	0	3	3
-----	E4 Elective – IV	3	0	0	3	3
-----	E5 Elective – V	3	0	0	3	3
PRACTICALS						
BC1621	Web Applications Laboratory	0	0	3	1	3
BC1622	Project Work	0	0	12	6	12
	TOTAL	15	0	17	23	32

LIST OF ELECTIVES

SPECIALIZATION ON MULTIMEDIA & ANIMATION

S.No	Course Title	L	T	P	C	TCH
Semester V						
BC1615	Distributed Database Systems	3	0	0	3	3
BC1616	Advance Data Warehousing	3	0	0	3	3
Semester VI						
BC1617	Advance Database	3	0	0	3	3
BC1618	Advance Data Mining	3	0	0	3	3
BC1619	Database Engineering	3	0	0	3	3

SEMESTER – I

EL 1105 - ENGLISH – I

(Common to all undergraduate branches)

L T P C

4 0 0 4

UNIT I: LISTENING SKILL

12

Listening to short conversations, telephone conversations and monologues – Listening to prose & poetry reading -- Listening to sounds and silent letters in English -- Listening to movies – Listening for the gist of the text -- Listening for general meaning and specific information -- Listening for multiple-choice questions -- Listening for positive & negative comments -- Listening for interpretation.

UNIT II: SPEAKING SKILL

12

Self-introduction -- Giving information about oneself -- Expressing personal opinion -- Simple oral interaction – Dialogue -- Conversation – Giving and receiving feedback using Johari window – Debates -- Brief presentations -- Differences between disagreeing and being disagreeable -- Participating in group discussions, role plays and interviews -- Generating talks based on visual or written prompts.

UNIT III: READING SKILL

12

Reading for skimming – Reading for scanning -- Reading for the gist of a text – Reading for specific information – Reading for information transfer and interpretation (pie chart & bar chart) - - Reading and interpreting anecdotes, short stories, poems – Reading prose passages for comments -- Reading and explaining a Fishbone diagram for pros and cons – Reading comprehension exercises for multiple-choice questions.

UNIT IV: WRITING SKILL

12

Writing emails, messages, notices, agendas -- Leaflets and brochures -- Writing paragraphs -- comparisons & contrasts -- Letter-writing -- letter to the editor -- Letter inviting, letter accepting or declining the invitation -- Arranging appointments -- Asking for permission -- Apologizing and offering compensation -- Dealing with requests -- Writing presentations with a plan -- Introduction, Body and Conclusion.

UNIT V: THINKING SKILL

12

Eliciting & imparting the knowledge of English using thinking blocks – Developing thinking skills along with critical interpretation side by side with the acquisition of English -- Decoding diagrams & pictorial representations into English words, phrases and expressions.

Total No .of.Periods:60

REFERENCES :

1. Norman Whitby. *Business Benchmark: Pre-Intermediate to Intermediate* – BEC Preliminary. New Delhi: Cambridge University Press, 2008 (Latest South Asian edition).
2. Devaki Reddy & Shreesh Chaudhary. *Technical English*. New Delhi: Macmillan, 2009.
3. Rutherford, Andrea J. *Basic Communication Skills for Technology*. 2nd edition. New Delhi: Pearson Education, 2010.

MA1104 - APPLIED MATHEMATICS -I

L T P C
4 1 0 4

UNIT I COMPLEX NUMBERS

12

Expansion of $\sin n\theta$ $\cos n\theta$ in terms of $\sin\theta$ and $\cos\theta$ - Expansion of $\sin n\theta$; $\cos n\theta$ in terms of sines and cosines of multiples of hyperbolic functions. Inverse hyperbolic functions.

UNIT II MATRICES

12

Rank of matrix - consistency and inconsistency of a system of linear equations – Eigen values and Eigen vectors – Properties - Cayley Hamilton theorem – Reduction of Quadratic form to Canonical form by Orthogonal reduction.

UNIT III DEFINITE INTEGRALS

12

Reduction formula for integral of $\sin nx$, $\cos nx$, $\tan nx$ – Definite integrals – Properties – Area of Cartesian Curves – volumes of Revolution.

UNIT IV ORDINARY DIFFERENTIAL EQUATIONS

12

Solution of second order with constant coefficients and Variable coefficients – complimentary function – particular integrals – simultaneous linear equations with constant coefficients of first order.

UNIT V APPLICATION OF DIFFERENTIATION

12

Curvature of a curve – Radius of a curvature in Cartesian form - Centre of curvature – Circle of curvature – Evolutes and Envelopes.

Total No .of.Periods:60

REFERENCES :

- 1 Veerarajan.T., "Engineering Mathematics", TMH Pub. Co. Ltd., New Delhi 1999.
- 2 Kandasamy.P., Thilagavathy.K. and Gunavathy.K. – "Engineering Mathematics, Volume – I", S.Chand & Co., New Delhi, 2001.

BC1101-COMPUTER CONCEPTS & PROBLEM SOLVING

L T P C
3 0 0 3

UNIT I FUNDAMENTALS OF COMPUTERS

9

Evolution of Computers – Inputs/Outputs – Alternative Methods of Input – Organization of Modern Digital Computers – Operating System – Multitasking OS – Graphical User Interface.

UNIT II WORD PROCESSING

9

Word Processing Programs and Their Uses – Word Processor's Interface – Editing Text – Formatting Text –Macro- Special Features of Word – Desktop Publishing Service – Converting doc into www pages

UNIT III SPREADSHEET SOFTWARE

9

Spreadsheet Programs – applications – Spreadsheet package features, attributes - structure, label, data, importing data, formula, functions – data handling – Managing workbooks.

UNIT IV INTRODUCTION TO COMPUTER PROBLEM SOLVING

9

Introduction – Problem Solving aspects-Top-Down Design-Implementation of Algorithms – Program Verification-Efficiency of Algorithms-Analysis of Algorithm-fundamental algorithm-factorial computation-generation of Fibonacci sequence.

UNIT V FACTORING AND ARRAY TECHNIQUES

9

Factoring Methods-finding the square root of a number-generating prime numbers- Array techniques array order reversal-Finding the maximum number in a set- Removal of duplicates from an ordered Array-finding the k^{th} smallest element.

Total No.of.Periods: 45

REFERENCES :

1 Peter Norton, "Introduction to Computers", 4th Edition, TMH Ltd, New Delhi, 2001.

2 R.G. Dromey, "How to solve it by Computers", Pearson Publishers, New Delhi, 2007.

BC1102 - DIGITAL LOGIC AND FUNDAMENTALS

L T P C
3 0 0 3

UNIT I INTRODUCTION TO DIGITAL DESIGN

9

Binary Systems : Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic Boolean Algebra and Logic Gates: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Digital Logic Gates.

UNIT II LOGIC GATES

9

Minimization: K-Map Method – Table Method, POS - SOP, Don't Care Conditions, NAND, NOR Implementation, Introduction to HDL. Combinational Logic: Combinational Circuits, Analysis and Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers.

UNIT III SEQUENTIAL CIRCUIT

9

Synchronous Sequential Logic: Sequential Circuits - Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment Design Procedure.

UNIT IV DIGITAL COMPONENTS

9

Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counters-Johnson Counter.

UNIT V CIRCUIT DESIGN

9

Asynchronous Sequential Circuit : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and Flow Tables, Race – Free State Assignment Hazards, Design Example.

Total No.of.Periods: 45

REFERENCES :

- 1 M.Morris Mano, "Digital Design", 3rd edition, Pearson Education, Delhi, 2007.
- 2 Donald P Leech, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications", Tata Mc Graw Hill, 2007.

BC1103 - PROGRAMMING IN C

L T P C
3 0 0 3

UNIT I INTRODUCTION TO C LANGUAGE

9

Overview of 'C' language – Constants, Variables and Data Types – Operators, Expressions and Assignment statements – Managing Input/Output Operations – Formatted I/O – Decision Making -Branching – IF, Nested IF – Switch – go to - Looping- While, do, for statements.

UNIT II ARRAYS AND FUNCTIONS

9

Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion.

UNIT III STRUCTURES AND UNIONS

9

Basics of Structures-Declaring a Structure – Array of Structures –Passing Structures elements to Functions- Passing entire Structure to Function – Structures within Structures - Union – Union of Structures – Enumerated Data Types – type of Statement.

UNIT IV POINTERS

9

Pointers – Declaration, Accessing a variable, dynamic memory allocation, Pointers versus Arrays, Array of pointers, Pointers to functions and structure Pointers.

UNIT V FILE MANAGEMENT

9

File Management in C – Data hierarchy- Files and Streams – Sequential access file- Random access file – Pre-processors.

Total No .of.Periods: 45

REFERENCES :

- 1 V.Rajaraman "Computer Programming in C" PHI, New Delhi, 2001
- 2 Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.
- 3 Yashavant P. Kanetkar " Pointers In C" , BPB Publications, New Delhi, 2002
- 4 E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004
- 5 Deitel and Deitel " C How to Program ", Addison Wesley , 2001

BC1121- DIGITAL LABORATORY

L	T	P	C
0	0	3	1

- 1 . Binary and BCD counter
- 2 . Verification of NAND, NOR, XOR, AND, OR Gate Logic
3. Parity Generator
- 4 . Multiplexer / De multiplexers
5. Adder / Subtractor
6. Code Converters
7. Up / Down 4 bit Binary Counter
- 8 . Up / Down 4 bit Decimal Counter
- 9 . Shift Register
- 10 . Ring Counter

BC1122-COMPUTER CONCEPTS AND PROBLEM SOLVING LABORATORY

L	T	P	C
0	0	3	1

1. Word Processing
2. Spreadsheet
3. Power point
4. Factorial
5. Fibonacci
6. Prime Generation
7. Removal of duplicates from an ordered Array
8. Finding the k^{th} smallest element.

BC1123-C PROGRAMMING LABORATORY

L T P C
0 0 3 1

1 Input / output function

2 Control Functions

3 Functions

4 Arrays

5 Pointers

6 Structures and Unions

7 Files

Using case studies on: Roots of a quadratic equation, Measures of location – Matrix Operations – Evaluation of trigonometric functions – Pay roll problems. String operations like substring, concatenation, finding a string from a given paragraph, finding the number of words in a paragraph.

SEMESTER - II

EL1106 - ENGLISH – II

(Common to all undergraduate branches)

L T P C

4 0 0 4

UNIT I: LISTENING SKILL

12

Listening to long dialogues, extended conversations, discussions, soliloquies -- Listening to modern prose & poetry -- Listening to sounds and stressed syllables in English -- Listening to feature films – Listening to presentations – multiple-choice questions – Listening to interviews – Listening to technical topics -- Listening for the gist of the text -- Listening for general meaning and specific information -- Listening for identifying a topic -- Listening for filling the gaps -- Listening for advanced interpretation.

UNIT II: SPEAKING SKILL

12

Speaking casually to an individual, a small group, a large audience – Addressing a gathering formally -- Speaking to speculate, compare, contrast, justify, agree and disagree on advanced topics – Talking about present and past experiences and future plans – Debates, discussions and role plays on advanced topics – Job interviews – Preparing HR questions with possible answers -- Brief presentations – Arguing out a topic without verbal fights -- Power point presentation based on current topics.

UNIT III: READING SKILL

12

Reading for advanced skimming and scanning -- Reading for the gist of a text – Reading for specific information – Reading for understanding the text structure, sentence structure and error identification – Reading for contextual meaning -- Reading newspapers, magazine articles and critical texts – Reading advanced short stories, poems and prose passages for intellectual and emotional comments -- Reading short texts for identifying unnecessary words. – Reading exercises for multiple-choice questions.

UNIT IV: WRITING SKILL

12

Writing Instructions, recommendations, functional checklists – Writing the minutes of a meeting – Writing formal business letters – sales, placing orders, complaints -- Letter requesting permission for industrial visits or implant training, enclosing an introduction to the educational institution -- Letters of application for a job, enclosing a CV or Resume -- Writing short reports -- describing, summarizing -- Industrial accident reports -- Writing short proposals -- describing, summarizing, recommending, persuading.

UNIT V: THINKING SKILL

12

Imparting the knowledge of English using thinking blocks – Conversion of thinking blocks into orthographic version -- Interpretation and acquisition of English -- Decoding diagrams and pictorial representations into English idioms, sayings and proverbs.

Total No .of.Periods:60

REFERENCES :

1. Norman Whitby. *Business Benchmark: Pre-Intermediate to Intermediate* – BEC Preliminary. New Delhi: Cambridge University Press, 2008.
2. Devaki Reddy & Shreesh Chaudhary. *Technical English*. New Delhi: Macmillan, 2009.
3. Rutherford, Andrea J. *Basic Communication Skills for Technology*. 2nd edition. New Delhi: Pearson Education, 2010.

MA1105 - APPLIED MATHEMATICS - II

L T P C
4 1 0 4

UNIT I MULTIPLE INTEGRALS 12

Double integration- Cartesian and polar co-ordinates- Change of order of integration- Area as a double integral, Change of variables between Cartesian and polar co- ordinates- Triple integration- Volume as a triple integral

UNIT II FOURIER SERIES 12

Dirichlet's condition-General Fourier series-Odd and even functions-Half range Fourier series- Parseval's identity-Harmonic analysis

UNIT III COMPLEX DIFFERENTIATION 12

Functions of complex variable-analytic function-Necessary Condition-Cauchy Riemann equation-Sufficient conditions (excluding proof) -Properties of analytic functions- Harmonic conjugate-Construction of analytic functions – Conformal Mapping - $w=z+a$, $w=az$, $w=1/z$, $w=z^2$ - Bilinear transformation.

UNIT IV COMPLEX INTEGRATION 12

Statement and applications of Cauchy's Integral theorem and formula-Taylor's and Laurent's expansions- Isolated singularities- Residues-Cauchy's residue theorem- Contour integration over unit circle and semi circular contour (excluding poles on boundaries)

UNIT V LAPLACE TRANSFORM 12

Laplace Transforms-Condition for existence-Transforms of Elementary functions- Basic properties-Derivatives and integrals of transforms- Transforms of derivatives and integrals – Initial and Final value theorem- Transform of unit step functions and impulse function- Transform of Periodic function-Inverse Laplace transform- Convolution theorem- Solution of linear ODE of second order with constant co- efficient, using Laplace transformation

Total No.of Periods: 60

REFERENCES:

- 1 Kandasamy. P, Thilagavathy K and Gunavathy K, Engineering Mathematics for First year B.E/B.Tech, S.Chand and company Ltd, New Delhi-110055, Seventh Revised edition 2007
- 2 Veerarajan T , Engineering Mathematics (for First year) Tata Mc Graw Hill Publishing co. New Delhi 110008 (2008)
- 3 Grewal B.S, Higher Engineering Mathematics 38th edition, Khanna Publishers New Delhi (2004)

BC1201- DATA STRUCTURES

L T P C
3 0 0 3

UNIT I	PROBLEM SOLVING	9
Problem solving – Top-down Design– Implementation– Verification– Efficiency–Analysis – Sample algorithms.		
UNIT II	LISTS, STACKS AND QUEUES	9
Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT		
UNIT III	TREES	9
Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap		
UNIT IV	SORTING	9
Preliminaries– Insertion Sort – Shells sort –Heap sort– Merge sort–Quick sort– External Sorting		
UNIT V	GRAPHS	9
Definitions– Topological Sort– Shortest-Path Algorithms–Un weighted Shortest Paths– Dijkstra’s Algorithm– Minimum Spanning Tree– Prim’s Algorithm– Applications of Depth- First Search–Undirected Graphs –Bi connectivity– Introduction to NP-Completeness		

Total No. of periods : 45

REFERENCES:

- 1 R. G. Dromey, “How to Solve it by Computer” (Chaps 1-2), Prentice-Hall of India, 2002.
- 2 M. Allen Weiss, “Data Structures and Algorithm Analysis in C”, 2nd edition, Pearson Education Asia, 2002.
- 3 ISRD Group, “Data Structures using C”, Tata McGraw Hill, 2007
- 4 Richard F. Gilberg, Behrouz A. Forouzan, “Data Structures – A Pseudocode Approach with C”, Thomson Brooks / COLE, 1998.

BC1202- MICROPROCESSORS AND ITS APPLICATIONS

L T P C
3 0 0 3

- UNIT I INTRODUCTION TO 8085 MICROPROCESSOR 9**
8085 Microprocessor: The 8085 MPU– Architecture – Instruction formats – Addressing modes – Instruction set – Programming with 8085 – 8085 based microcomputer system.
- UNIT II INTRODUCTION TO 8086 MICROPROCESSOR 9**
8086 Software Aspects: Intel 8086 Microprocessor – Architecture – Assembly Language Programming – Linking and relocation – Stacks – Procedures – Macros - Interrupts and Interrupt Routines – Byte & String Manipulation
- UNIT III 8086 SYSTEM DESIGN 9**
8086 System Design:8086 signals – Basic configurations – System bus timing – system design using 8086 – Multiprocessor configurations – Coprocessor, Closely coupled and loosely coupled configurations.
- UNIT IV 8086 MICROPROCESSOR INTERFACING 9**
I/O Interfaces: Serial Communication Interface – Parallel communication interface – Programmable Timer – Keyboard and Display controller – DMA controller – Interrupt controller – Maximum Mode and 16-bit bus interface designs.
- UNIT V ADVANCED PROCESSORS 9**
Advanced Processors: Intel’s 80X 86 families of processors – Salient features of 80286, 80386, 80486 and the Pentium Processors.

Total No.of periods: 45

REFERENCES:

- 1 Ramesh S.Gaonkar, “Microprocessor Architecture, Programming and Applications with the 8085”, 4th Edition, Penram International Publishing (India) Pvt. Ltd., 1999.
- 2 Douglas v. Hall, “Microprocessors and Interfacing”, Tata Mcgraw Hill, 1999.
- 3 Yu-cheng liu and Glenn a. Gibson, “Microcomputer Systems: The 8086/8088 Family Architecture, Programming & Design”, 2nd Edition, Prentice Hall of India pvt. Ltd., 2001.
- 4 Barry b.Brey, “The Intel Microprocessors – 8086/8088, 80186, 286, 386, 486, Pentium and Pentium Pro Processor”, Prentice Hall of India Pvt. Ltd., 1998.

BC 1203-INTRODUCTION TO ACCOUNTING

L T P C
4 1 0 3

UNIT I **9**
Commerce definition – Elements – Form of business – Sole Proprietor – Partnership – company – Private and Public – Public sector: Features and merits.

UNIT II **9**
Introduction to Marketing Definition, nature, scope and importance of marketing, Approaches to the study of marketing and economic development, traditional and modern concept of marketing, Function of marketing.

UNIT III **9**
Fundamentals of Bookkeeping – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books – Trail balance – Preparation of bank reconciliation statement – Errors and their rectification.

UNIT IV **9**
Bills of Exchange: Accommodation bills – Account Current – Average due date.

UNIT V **9**
Final Accounts: Opening, Closing and Adjustment entries – Manufacturing, Trading and Profit and Loss Accounts – Balance Sheet, Accounts of non-profit organizations- receipts and payments and income and expenditure accounts and balance sheet; Accounts of professionals.

Total No.of periods: 45

REFERENCES :

- 1 Jain and Nearing, "Advanced Accounting", Kalia Publishers
- 2 Gupta R L and Radhaswamy M, "Advanced Accountancy", Sultan Chand
- 3 Tulsian P C, "Financial Accounting", Tata Mc. Graw Hill Publications
- 4 Bhushan Y K, "Business Organisation", S.Chand & Co.

LIST OF EXERCISES

Implement the following exercises using C:

1. Array implementation of List Abstract Data Type (ADT)
2. Linked list implementation of List ADT
3. Cursor implementation of List ADT
4. Array implementations of Stack ADT
5. Linked list implementations of Stack ADT

The following three exercises are to be done by implementing the following source files

- (a) Program for 'Balanced Parenthesis'
- (b) Array implementation of Stack ADT
- (c) Linked list implementation of Stack ADT
- (d) Program for 'Evaluating Postfix Expressions'

An appropriate header file for the Stack ADT should be #included in (a) and (d)

6. Implement the application for checking 'Balanced Parenthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
7. Implement the application for checking 'Balanced Parenthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 6 and implementing file (c))
8. Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b), and then by using files (d) and (c))
9. Queues ADT
10. Search Tree ADT - Binary Search Tree

BC1222-MICROPROCESSORS LAB

L T P C
0 0 3 1

1. Fundamentals of 8085 Programming
2. Fundamentals of 8086 Programming
3. Interfacing with Input/output Devices
4. Parallel peripheral Input/output – Timer – Keyboard Controller – Display
5. Controller – Interrupt Controller, Communication Input/output.

BC1223-ACCOUNTING LABORATORY

L T P C
0 0 3 1

THEORY

Accounting – Introduction, Features, Objectives -Configuration, Chart of Accounts - Accounting Package – Concepts of Double Entry System – (15) Concepts of preparing Final Accounts

LIST OF EXERCISES

1. Company Creation, preparation of groups
2. Preparation of ledgers
3. Preparation of Voucher
4. Preparation of Profit and Loss Account
5. Preparations of Final Accounts with and without Adjustments
6. Cash Flow and Fund Flow Analysis
7. Preparation of Ratio Analysis
8. Stock Transactions
9. F11 – Features and F12 – Configurations
10. Other Features and Report Generation

SEMESTER-III

MA1203 - APPLIED MATHEMATICS III

L T P C
4 1 0 4

UNIT I PARTIAL DIFFERENTIAL EQUATIONS

12

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of standard types of first order partial differential equations – Lagrange's linear equation – Linear partial differential equations of second and higher order with constant coefficients.

UNIT II FOURIER SERIES

12

Dirichlet's conditions – General Fourier series – Odd and even functions – Half range sine series– Half range cosine series – Complex form of Fourier Series – Parseval's identify – Harmonic Analysis.

UNIT III BOUNDARY VALUE PROBLEMS

12

Classification of second order quasi linear partial differential equations – Solutions of one dimensional wave equation – One dimensional heat equation – Steady state solution of two dimensional heat equation (Insulated edges excluded) – Fourier series solutions in Cartesian coordinates.

UNIT IV FOURIER TRANSFORM

12

Fourier integral theorem (without proof) – Fourier transform pair – Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

UNIT V Z -TRANSFORM AND DIFFERENCE EQUATIONS

12

Z-transform - Elementary properties – Inverse Z – transform – Convolution theorem -Formation of difference equations – Solution of difference equations using Z - transform.

Total No .of.Periods: 60

REFERENCES :

1. Grewal, B.S., "Higher Engineering Mathematics", Thirty Sixth Edition, Khanna Publishers, Delhi, 2001.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., "Engineering Mathematics Volume III", S. Chand & Company Ltd., New Delhi, 1996.
3. Wylie C. Ray and Barrett Louis, C., "Advanced Engineering Mathematics", Sixth Edition, McGraw-Hill, Inc., New York, 1995.
4. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., "Advanced Mathematics for Engineering Students", Volumes II and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd. Chennai, 2002.

BC1301-ALGORITHM DESIGN TECHNIQUES

LT PC
3 0 0 3

UNIT I INTRODUCTION

9

Introduction – Notion of Algorithm - Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms.

INIT II DIVIDE AND CONQUER METHOD AND GREEDY METHOD

9

Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Multiplication of large integers – Strassen’s matrix multiplication – Greedy method – Prim’s algorithm – Kruskal’s algorithm – Dijkstra’s algorithm.

UNIT III DYNAMIC PROGRAMMING

9

Computing a binomial coefficient– Warshall’s and Floyd’ algorithm – Optimal binary search tree Knapsack problem – Memory functions.

UNIT IV BACKTRACKING AND BRANCH AND BOUND

9

Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Travelling salesman problem.

UNIT V NP-HARD AND NP-COMPLETE PROBLEMS

9

P & NP problems–NP-complete problems –Approximation algorithms for NP-hard problems – Travelling salesman problem – Knapsack problem.

Total No .of. Periods: 45

REFERENCES :

1. Anany Levitin “Introduction to the Design and Analysis of Algorithms” Pearson Education 2003.
2. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, “Introduction to algorithms” Prentice Hall 1990.
3. SaraBaase and Allen Van Gelder, “Computer Algorithms – Introduction to Design and Analysis” Pearson education, 2003.
4. A.V.Aho, J.E Hopenfit and J.D.Ullman, “The Design and Analysis of Computer algorithms” Pearson education Asia, 2003.

BC1302 - SOFTWARE ENGINEERING

LT PC
4 0 0 4

UNIT I SOFTWARE PROCESS

9

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT II SOFTWARE REQUIREMENTS

9

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping - S/W document. Analysis and modelling – data, functional and behavioural models – structured analysis and data dictionary.

UNIT III DESIGN CONCEPTS AND PRINCIPLES

9

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems - Real time software design – system design – real time executives – data acquisition system - monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

UNIT IV TESTING

9

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

UNIT V SOFTWARE PROJECT MANAGEMENT

9

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

Total No .of.Periods : 45

REFERENCES :

1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 6th edition, 2004.
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and Witold Pedrycz, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.

BC1303 - OBJECT ORIENTED PROGRAMMING

L T P C
4 1 0 4

UNIT I INTRODUCTION

9

Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals – data types, operators and expressions, control flow, arrays, strings, pointers and functions.

UNIT II PROGRAMMING IN C++

9

Classes and objects – constructors and destructors, operator overloading – inheritance, virtual functions and polymorphism

UNIT III FILE HANDLING

9

C++ streams – console streams – console stream classes-formatted and unformatted console I/O operations, manipulators - File streams - classes file modes file pointers and manipulations file I/O – Exception handling

UNIT IV JAVA INTRODUCTION

9

An overview of Java, data types, variables and arrays, operators, control statements, classes, objects, methods – Inheritance.

UNIT V JAVA PROGRAMMING

9

Packages and Interfaces, Exception handling, Multithreaded programming, Strings, Input /Output.

Total No .of. Periods: 45

REFERENCES :

1. Herbert Schildt, "the Java 2 : Complete Reference", Fourth edition, TMH, 2002 (Unit IV, Unit-V)(Chapters 1-11,13,17)
2. Ira Pohl, "Object oriented programming using C++", Pearson Education Asia, 2003
3. Bjarne Stroustrup, "The C++ programming language", Addison Wesley, 2000
4. John R.Hubbard, "Progranning with C++", Schaums outline series, TMH, 2003
5. H.M.Deitel, P.J.Deitel, "Java : how to program", Fifth edition, Prentice Hall of India private limited.

BC1304 - COMPUTER ARCHITECTURE

L T P C
4 0 0 3

UNIT I BASIC STRUCTURE OF COMPUTERS

9

Functional units - Basic operational concepts - Bus structures - Software performance – memory locations and addresses – Memory operations – Instruction and instruction sequencing –Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II ARITHMETIC UNIT

9

Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III BASIC PROCESSING UNIT

9

Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV MEMORY SYSTEM

9

Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V I/O ORGANIZATION

9

Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

Total No .of. Periods: 45

REFERENCES :

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition “Computer Organization”, McGraw-Hill, 2002.
2. William Stallings, “Computer Organization and Architecture – Designing for Performance”, 6th Edition, Pearson Education, 2003.
3. David A.Patterson and John L.Hennessy, “Computer Organization and Design: The hardware / software interface”, 2nd Edition, Morgan Kaufmann, 2002.
4. John P.Hayes, “Computer Architecture and Organization”, 3rd Edition, McGraw Hill, 1998.

EXPERIMENTS

C++

1. Programs Using Functions
 - Functions with default arguments
 - Implementation of Call by Value, Call by Address and Call by Reference
2. Simple Classes for understanding objects, member functions and Constructors
 - Classes with primitive data members
 - Classes with arrays as data members
 - Classes with pointers as data members – String Class
 - Classes with constant data members
 - Classes with static member functions
3. Compile time Polymorphism
 - Operator Overloading including Unary and Binary Operators.
 - Function Overloading
4. Runtime Polymorphism
 - Inheritance
 - Virtual functions
 - Virtual Base Classes
 - Templates
5. File Handling
 - Sequential access
 - Random access

JAVA

6. Simple Java applications
 - for understanding reference to an instance of a class (object), methods
 - Handling Strings in Java
7. Simple Package creation.
 - Developing user defined packages in Java
8. Interfaces
 - Developing user-defined interfaces and implementation
 - Use of predefined interfaces
9. Threading
 - Creation of thread in Java applications
 - Multithreading
10. Exception Handling Mechanism in Java
 - Handling pre-defined exceptions
 - Handling user-defined exceptions

Total No .of.Periods: 45

BC1322 - ALGORITHMS DESIGN LABORATORY

L T P C
0 0 3 1

1. Apply the divide and Conquer technique to arrange a set of numbers using merge sort method.
2. Perform Strassen's matrix multiplication using divide and conquer method.
3. Solve the knapsack problem using greedy method.
4. Construct a minimum spanning tree using greedy method.
5. Construct optimal binary search trees using dynamic programming method of problem solving.
6. Find the solution for travelling salesperson problem using dynamic programming approach.
7. Perform graph traversals.
8. Implement the 8-Queens Problem using backtracking.
9. Implement knapsack problem using backtracking.
10. Find the solution of travelling salesperson problem using backtracking

Total No .of. Periods : 45

BC1323 - SOFTWARE ENGINEERING LABORATORY

L T P C
0 0 3 1

LIST OF EXERCISES:

1. Practice requirements elicitation
2. Practice requirement analysis and project plan
3. SRS Documentation
4. Cost estimation models
5. Practice design techniques using case tools.
6. Simulate Software architectural components.
7. Generation of test cases for testing
8. Unit testing
9. Integration testing
10. Creating software documentation for all the phases of software life cycle
11. development.
12. Note: All the above exercises are to be carried out by using any real time
13. application such as Library Management System, Payroll processing, Hospital
14. management system, Inventory management etc.,. Any other application
15. indicated by the Instructor can also be used.

Total No .of. Periods: 45

SEMESTER-IV

MA1204 - NUMERICAL METHODS

L T P C
3 1 0 4

UNIT I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 12

Linear interpolation methods (method of false position) – Newton’s method – Statement of Fixed Point Theorem – Fixed point iteration: $x=g(x)$ method – Solution of linear system by Gaussian elimination and Gauss-Jordon methods- Iterative methods: Gauss Jacobi and Gauss-Seidel methods- Inverse of a matrix by Gauss Jordon method – Eigen value of a matrix by power method.

UNIT II INTERPOLATION AND APPROXIMATION 12

Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – Newton’s forward and backward difference formulas.

UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 12

Derivatives from difference tables – Divided differences and finite differences – Numerical integration by trapezoidal and Simpson’s 1/3 and 3/8 rules – Romberg’s method – Two and Three point Gaussian quadrature formulas – Double integrals using trapezoidal and Simpson’s rules.

UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 12

Single step methods: Taylor series method – Euler and modified Euler methods – Fourth order Runge – Kutta method for solving first and second order equations – Multistep methods: Milne’s and Adam’s predictor and corrector methods.

UNIT V BOUNDARY VALUE PROBLEMS IN ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS 12

Finite difference solution of second order ordinary differential equation – Finite difference solution of one dimensional heat equation by explicit and implicit methods – One dimensional wave equation and two dimensional Laplace and Poisson equations.

Total No .of. Periods : 60

REFERENCES :

1. Gerald, C.F, and Wheatley, P.O, “Applied Numerical Analysis”, Sixth Edition, Pearson Education Asia, New Delhi, 2002.
2. Kandasamy, P., Thilagavathy, K. and Gunavathy, K., “Numerical Methods”, S.Chand Co. Ltd., New Delhi, 2003
3. Balagurusamy, E., “Numerical Methods”, Tata McGraw-Hill Publication Co.Ltd, New Delhi, 1999.
4. Burden, R.L and Faires, T.D., “Numerical Analysis”, Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002

BC1401 - OPERATING SYSTEMS

L T P C
3 0 0 3

UNIT I INTRODUCTION 9

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems – Hardware Protection- System Components – Operating System Services – System Calls – System Programs -Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes –Inter-process Communication.

UNIT II SCHEDULING 9

Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III MEMORY ALLOCATION 9

System Model – Deadlock Characterization – Methods for handling Deadlocks –Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks – Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV MEMORY MANAGEMENT 9

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V FILE STRUCTURE 9

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

Total No .of.Periods:45

REFERENCE BOOKS

1. Abraham Silberschartz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.
2. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education Pvt. Ltd, 2002.
3. William Stallings, “Operating System”, Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P. Bhatt – “An Introduction to Operating Systems, Concepts and Practice”, PHI, 2003.

BC1402 - COMPUTER NETWORKS

L T P C
3 0 2 4

UNIT I	DATA COMMUNICATIONS	9
Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies – Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.		
UNIT II	DATA LINK LAYER	9
Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.		
UNIT III	NETWORK LAYER	9
Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers.		
UNIT IV	TRANSPORT LAYER	9
Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.		
UNIT V	APPLICATION LAYER	9
Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.		

Total No .of.Periods : 45

REFERENCES :

1. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw-Hill, 2004.
2. James F. Kurose and Keith W. Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.
3. Andrew S. Tanenbaum, “Computer Networks”, PHI, Fourth Edition, 2003.
4. William Stallings, “Data and Computer Communication”, Sixth Edition, Pearson Education, 2000.

BC1403 - DATABASE MANAGEMENT SYSTEMS

L T P C
3 0 0 3

UNIT I INTRODUCTION

Advantages and Components of a Database Management Systems - Feasibility Study – Class Diagrams - Data Types - Events - Normal Forms - Integrity - Converting Class Diagrams to Normalized Tables - Data Dictionary.

UNIT II QUERY

Query Basics - Computation Using Queries - Subtotals and GROUP BY Command - Queries with Multiple Tables – Sub queries - Joins - DDL & DML - Testing Queries.

UNIT III REPORTS

Effective Design of Forms and Reports - Form Layout - Creating Forms - Graphical Objects - Reports - Procedural Languages - Data on Forms - Programs to Retrieve and Save Data - Error Handling.

UNIT IV DATABASE STORAGE

Power of Application Structure - User Interface Features - Transaction - Forms Events - Custom Reports - Distributing Application - Table Operations - Data Storage Methods - Storing Data Columns - Data Clustering and Partitioning.

UNIT V : DATABASE ADMINISTRATION

Database Administration - Development Stages - Application Types - Backup and Recovery - Security and Privacy - Distributed Databases - Client/Server Databases Web as a Client/Server System - Objects - Object Oriented Databases - Integrated Applications.

Reference:

1. G. V. Post - Database Management Systems Designing and Building Business Application - McGraw Hill International edition - 1999.
2. Raghu Ramakrishnan - Database Management Systems - WCB/McGraw Hill - 1998.
3. C.J. Date - An Introduction to Database Systems - 7th Edition - Addison Wesley - 2000.

BC1404 - COMPUTER GRAPHICS

L T P C
3 0 0 3

UNIT I	OVERVIEW OF COMPUTER GRAPHICS SYSTEM	9
Over View of Computer Graphics System – Video display devices – Raster Scan and random scan system – Input devices – Hard copy devices.		
UNIT II	OUTPUT PRIMITIVES AND ATTRIBUTES	9
Drawing line, circle and ellipse generating algorithms – Scan line algorithm – Character generation – attributes of lines, curves and characters – Antialiasing.		
UNIT III	TWO DIMENSIONAL GRAPHICS TRANSFORMATIONS AND VIEWING	9
Two-dimensional Geometric Transformations – Windowing and Clipping – Clipping of lines and clipping of polygons.		
UNIT IV	THREE DIMENSIONAL GRAPHICS AND VIEWING	9
Three-dimensional concepts – Object representations- Polygon table, Quadric surfaces, Splines Bezier curves and surfaces – Geometric and Modelling transformations – Viewing - Parallel and perspective projections.		
UNIT V	IREMOVAL OF HIDDEN SURFACES	9
Visible Surface Detection Methods – Computer Animation.		

Total No .of.Periods : 45

REFERENCES :

1. Hearn, D. and Pauline Baker,M., Computer Graphics (C-Version),2nd Edition, Pearson Education.
2. Neuman, W.M., and Sproull, R.F., Principles of Interactive Computer Graphics, 2nd Edition, McGraw Hill Book Co.

BC1421 - OPERATING SYSTEM LAB

L T P C
0 0 3 1

(Implement the following on LINUX platform. Use C for high level language implementation)

1. Shell programming- command syntax- write simple functions- basic tests
2. Shell programming- loops- patterns- expansions- substitutions
3. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, open dir, read dir
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
5. Write C programs to simulate UNIX commands like ls, grep, etc.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
7. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
8. Implement the Producer – Consumer problem using semaphores.
9. Implement some memory management schemes – I
10. Implement some memory management schemes – II

Example for expt 9 & 10 :

Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space. When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

Total No .of.Periods: 45

**COMPUTER NETWORKS LABORATORY
(COMPONENT LAB BC1402-COMPUTER NETWORKS)**

1. Applications using TCP Sockets like
 - a. Echo client and echo server
 - b. File transfer
 - c. Remote command execution
 - d. Chat
 - e. Concurrent server
2. Applications using UDP Sockets like
 - a. DNS
 - b. SNMP
3. Applications using Raw Sockets like
 - a. Ping
- b. Trace route
 4. RPC
5. Experiments using simulators like OPNET:
 - a. Performance comparison of MAC protocols
 - b. Performance comparison of Routing protocols
 - c. Study of TCP/UDP performance

BC1422 - RELATIONAL DATABASE MANAGEMENT SYSTEMS LAB

L T P C
0 0 3 1

Creation of a Database and performing the operations given below using a Menu Driven Program.

a) Insertion b) Deletion c) Modification d) Generating a Simple report for the following:

1. Payroll
2. Mark sheet Processing
3. Saving Bank account for banking
4. Inventory System
5. Library information system
6. Student information system
7. Electricity bill preparation system
8. Telephone directory maintenance.

BC1423- COMPUTER GRAPHICS LABORATORY

L T P C
0 0 3 1

1. Line drawing algorithms
2. Circle drawing algorithms
3. Eclipse drawing algorithms
4. Two dimensional transformations
5. Windowing and clipping
6. Three dimensional transformations
7. Simple animation

Total No .of.Periods: 45

SEMESTER V

BC1501 - MULTIMEDIA SYSTEMS

L T P C
3 0 0 3

UNIT I INTRODUCTION TO MULTIMEDIA

9

Introduction to making Multimedia- Multimedia Skills and training- Text: Using text in Multimedia-Computer and Text- Font Editing and Design Tools- Hypermedia and Hypertext

UNIT II MULTIMEDIA FILE HANDLING

9

Sound – Images – Animation – Video

UNIT III DIGITAL VIDEO AND IMAGE COMPRESSION

9

Evaluating a compression system – Redundancy and visibility-Video compression techniques- Standardization of an algorithm – The JPEG image compression standard-ITU –T Standards – MPEG motion video compression standard-DVI Technology.

UNIT IV HARDWARE, SOFTWARE AND MULTIMEDIA AUTHORIZING TOOLS

9

Multimedia Hardware: Macintosh and Windows production platforms-Hardware Peripherals: Memory and Storage Devices, Input Devices, Output Devices, Communication Devices .Basic Software Tools

UNIT V MULTIMEDIA AND INTERNET

9

Internetworking –connections –Internet services –Tools for WWW – Designing WWW.

Total No .of.Periods :45

REFERENCES :

1. Multimedia: Making It Work, Tay Vaughan, 7th Edition, Tata Mc-Graw Hill.(Unit I, II, IV and V), 2008.
2. Multimedia Systems, John F.Koegel Buford, Pearson edition, 2003. (unit III).
3. Ranjan Parekh, Principles of Multimedia, TMH, 2006.
4. Multimedia: Computing, Communication and applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Edition, 2001.

BC1502 - INTERNET PROGRAMMING

L T P C
3 1 0 4

UNIT I BASIC NETWORK AND WEB CONCEPTS 9
Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.

UNIT II JAVA PROGRAMMING 9
Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client /server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation.

UNIT III SCRIPTING LANGUAGES 9
HTML – forms – frames – tables – web page design - JavaScript introduction – control structures– functions – arrays – objects – simple web applications

UNIT IV DYNAMIC HTML 9
Dynamic HTML – introduction – cascading style sheets – object model and collections –event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data

UNIT V SERVER SIDE PROGRAMMING 9
Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.

Total No .of.Periods : 45

REFERENCES :

1. Deitel, Deitel and Nieto, "Internet and World Wide Web – How to program", Pearson Education Publishers, 2000.
2. Elliotte Rusty Harold, "Java Network Programming", O'Reilly Publishers, 2002
3. R. Krishnamoorthy & S. Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.
4. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata McGraw Hill, 2003.
5. McGraw Hill, 2003.
6. Naughton, "The Complete Reference – Java2", Tata McGraw-Hill, 3rd edition, 1999.

BC1503 - COMPILER DESIGN

L T P C
3 1 0 4

UNIT I INTRODUCTION TO COMPILING

9

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II SYNTAX ANALYSIS

9

Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing – recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.

UNIT III INTERMEDIATE CODE GENERATION

9

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

UNIT IV CODE GENERATION

9

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS

9

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

Total No .of.Periods : 45

REFERENCES

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools", Pearson Education Asia, 2003.
2. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
3. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings,2003.
4. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.

BC1521 - MULTIMEDIA SYSTEMS LAB

L T P C
0 0 3 1

1. Create a simple painting program using Flash or equivalent.
2. Create a simple animated banner using Flash or equivalent.
3. Design an object dragging program.
4. Prepare a photo album using Flash or equivalent.
5. Create animated buttons which is used for web design using Adobe Photoshop or equivalent.
6. Design image mapping using Flash or equivalent.
7. Create image morphing using adobe Photoshop or equivalent.
8. Make animations using macromedia Flash or equivalent.
9. Create animated Gifs for use as banners, titles and buttons.
10. Create short film in Flash or equivalent using any theme.
11. To perform animation using any animation software.
12. To perform image editing using basic tool, masking effect and rendering effects using Photoshop or equivalent.

Total No .of.Periods: 45

LIST OF EXPERIMENTS

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features:
 - a) Create a color palette with matrix of buttons
 - b) Set background and foreground of the control text area by selecting a color from color palette.
 - c) In order to select Foreground or background use check box control as radio buttons
 - d) To set background images
4. Write programs in Java to do the following.
 - a) Set the URL of another server.
 - b) Download the homepage of the server.
 - c) Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
 - a) HTTP request
 - b) FTP
 - c) SMTP
 - d) POP3
6. Write a program in Java for creating simple chat application with datagram sockets and Data gram packets.
7. Write programs in Java using Servlets:
 - a) To invoke servlets from HTML forms
 - b) To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
 - a) To conduct an on-line examination.
 - b) To display student mark list. Assume that student information is available in a database which has been stored in a database server.
9. Create a web page with the following using HTML
 - a) To embed a map in a web page
 - b) To fix the hot spots in that map
 - c) Show all the related information when the hot spots are clicked.
10. Create a web page with the following.
 - a) Cascading style sheets.
 - b) Embedded style sheets.
 - c) Inline style sheets.
 - d) Use your college information for the web pages.

1. Implement a lexical analyzer in "C".
2. Use LEX tool to implement a lexical analyzer.
3. Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.
4. Use YACC and LEX to implement a parser for the same grammar as given in problem
5. Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and computes and prints its value.
6. Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.
7. Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

Total No .of.Periods: 45

SEMESTER VI

BC1601 - CRYPTOGRAPHY AND NETWORK SECURITY

LT PC
3 0 0 3

UNIT I INTRODUCTION

9

OSI Security Architecture - Classical Encryption techniques – Cipher Principles – Data Encryption Standard – Block Cipher Design Principles and Modes of Operation – Evaluation criteria for AES – AES Cipher – Triple DES – Placement of Encryption Function – Traffic Confidentiality

UNIT II PUBLIC KEY CRYPTOGRAPHY

9

Key Management - Diffie-Hellman key Exchange – Elliptic Curve Architecture and Cryptography - Introduction to Number Theory – Confidentiality using Symmetric Encryption – Public Key Cryptography and RSA.

UNIT III AUTHENTICATION AND HASH FUNCTION

9

Authentication requirements – Authentication functions – Message Authentication Codes – Hash Functions – Security of Hash Functions and MACs – MD5 message Digest algorithm – Secure Hash Algorithm – RIPEMD – HMAC Digital Signatures – Authentication Protocols – Digital Signature Standard

UNIT IV NETWORK SECURITY

9

Authentication Applications: Kerberos – X.509 Authentication Service – Electronic Mail Security –PGP – S/MIME - IP Security – Web Security.

UNIT V SYSTEM LEVEL SECURITY

9

Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems.

Total No .of. Periods: 45

REFERENCES

1. William Stallings, “Cryptography And Network Security – Principles and Practices”, Prentice Hall of India, Third Edition, 2003.
2. Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc, 2001.
3. Atul Kahate, “Cryptography and Network Security”, Tata McGraw-Hill, 2003.
4. Charles B. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Third Edition, Pearson Education, 2003.

BC1602 - DATA WAREHOUSING AND DATA MINING

L T P C
3 0 2 4

UNIT I INTRODUCTION AND DATA WAREHOUSING

9

Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining

UNIT II DATA PREPROCESSING, LANGUAGE, ARCHITECTURES, CONCEPT DESCRIPTION

9

Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.

UNIT III ASSOCIATION RULES

9

Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases

UNIT IV CLASSIFICATION AND CLUSTERING

9

Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorisation of methods, Partitioning methods, Outlier Analysis.

UNIT V RECENT TRENDS

9

Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining

Total No .of. Periods: 45

REFERENCES

1. J. Han, M. Kamber, "Data Mining: Concepts and Techniques", Harcourt India / Morgan Kauffman, 2001.
2. Margaret H.Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education 2004.
3. Sam Anahory, Dennis Murry, "Data Warehousing in the real world", Pearson Education 2003.
4. David Hand, Heikki Manila, Padhraic Symth, "Principles of Data Mining", PHI 2004.
5. W.H.Inmon, "Building the Data Warehouse", 3rd Edition, Wiley, 2003.
6. Alex Bezon, Stephen J.Smith, "Data Warehousing, Data Mining & OLAP", McGraw- Hill Edition, 2001.
7. Paulraj Ponniah, "Data Warehousing Fundamentals", Wiley-Interscience Publication, 2003.

1. Create a simple page introducing yourself how old you are, what you do, what you like and dislike. Modify the introduction to include a bullet list of what you do and put list the 5 things you like most and dislike as numbered lists. Create another page about your favourite hobby, and link it to (and from) your main page. Centre something, and put a quote on one of your pages
2. Put an existing image on a web page. Create a table, use a heading and at least one use of row span/column span. Colour a page and some text within the page. Link to another site
3. Create a new file called index. html.
 - * Put the normal HTML document structure tags in the file.
 - * Give it a title.
 - * At the bottom of the page (i.e. the last thing between the body tags) put the following:
 - * A horizontal rule.
 - * A link to your email address (with your name between the tag); remember to put the link to your email address within address tags.
 - * A line break.
 - *The date. (I have this same structure at the bottom of this page).
 - * Above this block (which is called the footer), put a title in heading tags.
 - * Add some text describing yourself (you can split this into multiple headings and paragraphs if you wish
4. Write a script to create an array of 10 elements and display its contents.
5. Write a function in Javascript that takes a string and looks at it character by character.
6. Create a simple calculator using form fields. Have two fields for number entry & one field for the result. Allow the user to be able to use plus, minus, multiply & divide.
7. Create a document and add a link to it. When the user moves the mouse over the link, it should load the linked document on it's own. (User is not required to click on the link).
8. Create a document, which opens a new window without a toolbar, address bar, or a status bar that unloads itself after one minute.
9. Create a document that accepts the user's name in a text field form and displays the same the next time when the user visits the site informing him that he has accessed the site for the second time, and so on.
10. Create a Web form for an online library. This form must be able to accept the Membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the book is to be returned, You can enhance the look of the page by using various ASPNET controls.
11. Display an advertisement at the bottom of the Web form that you created in question 10.
12. Create an array containing the titles of five new movies. Use this array as a data source for a drop down list control. The page must be capable of displaying the selected movie title to the user when the user clicks on the submit button.
13. Create a virtual directory in uS. Create a global.asax file and include the 'Session_Start' and 'Session_End' and, 'Application_BeginRequest' and 'Application_EndRequest' events. Write a simple ASP.NET page and execute it in the browser.

LIST OF ELECTIVES

BC1615 - DISTRIBUTED DATABASE SYSTEMS

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UNIT 1 OVERVIEW OF RELATIONAL DBMS

9

Relational Database Concepts, Normalization, Relational Data Languages, Review of Computer Networks: Types of Networks, Communication Schemes, Data Communication Concepts, Communication Protocols.

UNIT II DISTRIBUTED DATABASE DESIGN

9

Top-Down Design Process, Distribution Design Issues, Reasons for Fragmentation, Fragmentation Alternatives, Degree of Fragmentation, Correctness Rules of Fragmentation, Allocation Alternatives, Information Requirements, Fragmentation, Horizontal Fragmentation, Vertical Fragmentation, Hybrid Fragmentation, Allocation, Allocation Problem, Information Requirement, Allocation Model, Solution Methods, Data Directory.

UNIT III DATA AND ACCESS CONTROL

9

View Management, Views in Centralized DBMSs, Views in Distributed DBMSs, Maintenance of Materialized Views, Data Security Discretionary Access Control, Multilevel Access Control, Distributed Access Control, Semantic Integrity Control, Centralized Semantic Integrity Control, Distributed Semantic Integrity Control,

UNIT IV OVERVIEW OF QUERY PROCESSING

9

Query Processing Problem, Objectives of Query Processing, Complexity of Relational Algebra Operations, Characterization of Query Processors, Languages, Types of Optimization, Optimization Timing, Statistics, Decision Sites, Exploitation of the Network Topology, Exploitation of Replicated Fragments, Use of Semi joins, Layers of Query Processing, Query Decomposition, Data Localization, Global Query Optimization, Distributed Query Execution.

UNIT V QUERY DECOMPOSITION AND DATA LOCALIZATION

9

Query Decomposition, Normalization, Analysis, Elimination of Redundancy, Rewriting, Localization of Distributed Data. Reduction for Primary Horizontal Fragmentation, Reduction for Vertical Fragmentation, Reduction for Derived Fragmentation, Reduction for Hybrid Fragmentation

Total Periods: 45

REFERENCES:

1. "Principles of Distributed Database Systems" by M. Tamer Ozsu, Springer 3rd Edition
2. "Distributed Database Management system" by Saeed K. Rahimi, Frank S. Haug,

BC1616 - ADVANCED DATA WAREHOUSING

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3 0 0 3**

UNIT I DATA WAREHOUSE ENVIRONMENT 9

The Structure of The Data Warehouse, Subject Orientation, Day 1 to Day n Phenomenon, Granularity, The Benefits of Granularity, An Example of Granularity, Dual Levels of Granularity, Exploration and Data Mining , Living Sample Database, Partitioning as a Design Approach, Partitioning of Data, Structuring Data in the Data Warehouse, Auditing and the Data Warehouse, Data Homogeneity and Heterogeneity, Purging Warehouse Data, Reporting Warehouse Data, The Operational Window of Opportunity, Incorrect Data in the Data Warehouse.

UNIT II DATA WAREHOUSE AND DESIGN 9

Beginning with Operational Data, Process and Data Models and the Architected Environment, The Data Warehouse and Data Model, The Data Warehouse Data Model, The Midlevel Data Model, The Physical Data Model, The Data Model and Iterative Development, Normalization and Demoralization, Snapshots in the Data Warehouse, Metadata, Managing Reference Tables in a Data Warehouse, Cyclicity of Data-The Wrinkle of Time, Complexity of Transformation and Integration, Triggering the Data Warehouse Record, Events, Components of the Snapshots, Some Examples, Profile Records, Managing Volume, Creating Multiple Profile Record, Going From the Data Warehouse to the Operational Environment, Direct Operational Access of Data Warehouse Data, An Airline Commission Calculation System, A Retail Personalization System, Credit Scoring, Indirect Use of Data Warehouse Data, Star Joins, Supporting the ODS, Requirements and the Zachman Framework.

UNIT III DATA WAREHOUSE AND TECHNOLOGY 9

Managing Large Amounts of Data, Managing Multiple Media, Indexing and Monitoring Data, Interfaces to Many Technologies, Programmer or Designer Control of Data Placement, Parallel Storage and Management of Data, Meta Data Management, Languages Interface, Efficient Loading of Data , Efficient Index Utilization, Compaction of Data, Compound Keys, Variable Length Data, Lock Management, Index-only processing, east restore, other technology features, DBMS types and data warehouse, Changing DBMS Technology, Multidimensional DBMS and Data Warehouse, Data Warehousing across Multiple Storage Media, The Role of Metadata in the Data Warehouse Environment, Context and Contend, Three Types of Contextual Information , Capturing and Managing Contextual Information, Looking at the Past, Refreshing the Data Warehouse.

UNIT IV DISTRIBUTED DATA WAREHOUSE 9

Types of Distributed Data Warehouses, Local and Global Data Warehouses, The Local Data Warehouse The Global Data Warehouse, Intersection of Global and Local Data ,Intersection of Global and Local Data Redundancy , Access of Local and Global Data ,The Technologically Distributed Data Warehouse ,The independently Evolving Distributed Data Warehouse ,The Nature of the Development Efforts, Completely Unrelated Warehouses, Distributed Data Warehouse Development ,Coordinating Development across Distributed Locations, The Corporate Data Modal-Distributed, Metadata in the Distributed warehouse, Building the Warehouse on Multiple Levels ,Multiple Groups Building the Current Level of Detail, Other Types of Detailed Data, Metadata, Multiple Platforms for Common Detail Data.

UNIT V EXTERNAL DATA AND DATA WAREHOUSE 9

External Data in the Data Warehouse, Metadata and External Data, Storing External Data Different Components of External ,Modeling and External Data, Secondary Reports, Archiving External Data, Comparing Internal Data to External Data. Supporting the eBusiness Environment, Moving Data from the Web to the Data Warehouse, Moving Data from the Data Warehouse to the Web, Web Support.

Total Periods: 45

References:

1. “Building the Data Warehouse” (4th edition) by William . H .Inmon Published by Wiley
2. “Advanced Data Warehouse Design”, Malinowski, Elzbieta, Zimányi, Esteban, 2008

BC1617 - ADVANCED DATABASES**L T P C
3 0 0 3****UNIT- 1 RELATIONAL DATABASES 9**

Relational Model - Querying - Storage Structures - Query Processing - Normalization.

UNIT-II OBJECT ORIENTED DATABASES 9

Introduction to Object Oriented Data Bases - Approaches - Modeling and Design - Persistence - Transaction - Concurrency - Recovery - Database Administration.

UNIT-III EMERGING SYSTEMS 9

Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases.

UNIT-IV CURRENT ISSUES 9

Rules - Knowledge Bases - Active and Deductive Databases - Distributed Databases and Parallel databases.

UNIT-V DATABASE DESIGN ISSUES 9 Security - Integrity - Consistency - Database Tuning - Optimization and Research Issues.

Total Periods: 45

REFERENCES

1. R. Elmasri and S.B. Navathe, “Fundamentals of Database Systems”, Addison Wesley, 2000.
2. Gary W. Hanson and James V. Hanson, “Database Management and Design”, Prentice Hall of India Pvt Ltd, 1999.
 1. 3. Alex Benson, Stephen Smith and Kurt Thearling, “Building Data Mining Applications for CRM”, Tata McGraw-Hill, 2000.