AFFILIATED INSTITUTIONS

ANNA UNIVERSITY, CHENNAI

CURRICULUM & SYLLABI – 2010

B.C.A. (BACHELOR OF COMPUTER APPLICATIONS) – 3 YEARS

SEMESTER I

COURSE CODE	COURSE TITLE	L	T	P	C
THEORY					
YEN001	Technical English - I	4	0	0	4
YMA001	Applied Mathematics - I	3	1	0	4
YCS912	Computer Concepts & Problem Solving	3	0	0	3
YCS911	Digital Principles	3	0	0	3
YCS913	Programming in C	3	0	0	3
PRACTICALS					
YCS917	Digital Laboratory	0	0	3	2
YCS915	Computer Concepts and Problem Solving Laboratory	0	0	3	2
YCS916	C Programming Laboratory	0	0	3	2
	TOTAL	**16**	**1**	**9**	**23**

SEMESTER II

COURSE CODE	COURSE TITLE	L	T	P	C
THEORY					
YEN002	Technical English - II	4	0	0	4
YMA002	Applied Mathematics - II	3	1	0	4
YCS923	Data Structures	3	0	0	3
YCA921	Microprocessors	3	0	0	3
YCA922	Elements of Commerce	3	0	0	3
PRACTICALS					
YCS927	Data Structures Laboratory	0	0	3	2
YCA928	Microprocessors Lab	0	0	3	2
YCA929	Accounting Laboratory	1	0	3	2
	TOTAL	**17**	**1**	**9**	**23**

SEMESTER III

COURSE CODE	COURSE TITLE	L	T	P	C
THEORY					
YMA011	Applied Mathematics - III	3	1	0	4
YCS935	Algorithm Design Techniques	3	0	0	3
YCS934	Software Engineering	3	0	0	3
YCA931	Object Oriented Programming	3	0	0	3
YCS924	Computer Architecture	3	0	0	3
PRACTICALS					
YCA933	Object Oriented Programming Laboratory	0	0	3	2
YIT938	Algorithm Design Laboratory	0	0	3	2
YCT942	Software Engineering Lab	0	0	3	2
	TOTAL	**16**	**0**	**9**	**22**

SEMESTER IV

COURSE CODE	COURSE TITLE	L	T	P	C
THEORY					
YMA005	Numerical Methods	3	1	0	4
YCS942	Operating Systems	3	0	0	3
YCS951	Computer Networks	3	0	0	3
YCS932	Principles of Data Communication	3	0	0	3
YCS953	Computer Graphics	3	0	0	3
PRACTICALS					
YCT941	Operating Systems Lab	0	0	3	2
YCS957	Computer Networks Laboratory	0	0	3	2
YCT952	Computer Graphics Laboratory	0	0	3	2
	TOTAL	**15**	**1**	**9**	**22**

SEMESTER V

COURSE CODE	COURSE TITLE	L	T	P	C
THEORY					
YCS954	Multimedia Systems	3	0	0	3
YCS942	Internet Programming	3	0	0	3
YCS944	Compiler Design	3	0	0	3
E1	Elective – I	3	0	0	3
E2	Elective – II	3	0	0	3
PRACTICALS					
YSE956	Multimedia Systems Lab	0	0	3	2
YCS946	Internet Programming Lab	0	0	3	2
YCA947	Compiler Design Lab	0	0	3	2
	TOTAL	**15**	**0**	**9**	**21**

SEMESTER VI

COURSE CODE	COURSE TITLE	L	T	P	C
THEORY					
YCA961	Cryptography and Network Security	3	0	0	3
YCA962	Data Mining	3	0	0	3
E3	Elective – III	3	0	0	3
E4	Elective – IV	3	0	0	3
E5	Elective – V	3	0	0	3
PRACTICALS					
YCA965	Project Work	0	0	3	2
	TOTAL	**15**	**0**	**3**	**17`**

LIST OF ELECTIVES

Course Code	Course Title	L	T	P	C
YCS962	Information Security	3	0	0	3
YCS002	Management Information Systems	3	0	0	3
YCA001	Advanced Computer Architecture	3	0	0	3
YCA002	Advanced Operating Systems	3	0	0	3
YCS005	Client Server Computing	3	0	0	3
YCS001	Business Data Processing	3	0	0	3
YCS004	PC Testing and Trouble Shooting	3	0	0	3
YCS007	Software Testing	3	0	0	3
YCT006	Artificial Intelligence	3	0	0	3
YCS015	Software Project Management	3	0	0	3
YCS012	Mobile Computing	3	0	0	3
YCS003	Professional Ethics	3	0	0	3
YCS008	Image Processing	3	0	0	3
YCS016	Distributed Operating Systems	3	0	0	3
YCS017	Fuzzy Logic	3	0	0	3
YCS010	Decision Support Systems	3	0	0	3

YEN001	TECHNICAL ENGLISH - I	L	T	P	C
		4	0	0	4

UNIT I   ENGLISH TODAY   12

Modern English: varieties of discourse—regional variations—accent and dialects—social variations—occupational varieties and scientific English—medium and attitude; speaking and writing; formal and informal style—language change—new ways of studying English.

UNIT II   EXTENDING VOCABULARY: STRUCTURAL AND CONTENT WORDS   12

Principles of word formation; abbreviations and acronyms; foreign words and phrases; idioms and phrases—everyday computer—related words; scientific and technical terms.

UNIT III   GRAMMAR   12

Referring to people and things with the help of noun phrases- describing people and things with the help of determiners- adjectives and modifiers- making a message- varying the message: negation question exclamation inversion – expressing words referring to time, place and manner- reporting what people say or think – combining messages: coordination and subordination- making text- the structure of information.

UNIT IV   RECEPTIVE SKILL 1—LISTENING   12

Developing guided note taking from a lecture, recognizing and using descriptive words and phrases, completing information in a table, practicing dictation and checking spelling, developing accuracy in listening, imitating standard spoken English through native speakers' talk and presentation, listening for general and specific information, listening to news in the media and relating information to issues and locales around the world.

UNIT V   RECEPTIVE SKILL 2—READING   12

Predicting the content – skimming the text for gist- identifying the topic sentences – guessing the meaning of words from contexts – scanning for specific information – transfer of information – cloze reading.

TOTAL 60

REFERENCES :

1   Adrian Doff & Christopher Jones, "Language in use – intermediate", Cambridge University Press, 2003.

2   Gail Ellis and Barbara Sinclair, "Learning to learn English: A course in learner training", Cambridge University Press, 1989.

	L	**T**	**P**	**C**

YMA001   **APPLIED MATHEMATICS - I**   **L   T   P   C**
                                                        3   1   0   4

UNIT I   COMPLEX NUMBERS

12

Expansion of Sin $n\theta$ Cos $n\theta$ in terms of Sin θ and Cos θ - Expansion of $Sin^n\theta$; $Cos^n \theta$ in terms of sines and cosines of multiples of θ, 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 $sin^n x$, $cos^n x$, $tan^n x$ – 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.

LECTURE: 45   TUTORIALS: 15   TOTAL :   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.

YCS912   **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 kth smallest element.

                                                                          TOTAL :   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.

YCS911   **DIGITAL PRINCIPLES**   **L   T   P   C**
                                                                     3   0   0   3

UNIT I   **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   **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   **9**

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

UNIT IV   **9**

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

UNIT V   **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 : 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.

YCS913	**PROGRAMMING IN C**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

UNIT I   INTRODUCTION TO C LANGUGE   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 - Preprocessors.

                                                                TOTAL :   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 ", Addisson Wesley , 2001

YCS915	COMPUTER CONCEPTS AND PROBLEM SOLVING LABORATORY	L	T	P	C
		0	0	3	2

LIST OF EXERCISES

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 kth smallest element.

TOTAL : 45

		L	**T**	**P**	**C**
YCS916	**C PROGRAMMING LABORATORY**	**0**	**0**	**3**	**2**

LIST OF EXERCISES

Implementation of

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.

TOTAL: 45

		L	**T**	**P**	**C**
YCS917	**DIGITAL LABORATORY**	**0**	**0**	**3**	**2**

LIST OF EXERCISES

1   Binary and BCD counter
2   Verification of NAND, NOR, XOR, AND, OR Gate Logic
3   Parity Generator
4   Multiplexer / Demultiplexers
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

TOTAL : 45

YEN002   **TECHNICAL ENGLISH - II**

L   T   P   C
4   0   0   4

UNIT I   ENGLISH TODAY   12
British and American Words – Communicating across cultures- Dealing with Discrimination – non verbal communication – values, beliefs & practices, Body language, The importance of Listening, Speaking and Interpersonal communication– purpose of Messages in Organization.

UNIT II   GRAMMAR (FOCUS ON LANGUAGE)   12
Identifying the lexical and contextual meaning of words – expanding nominal compounds – framing of questions ('Wh' pattern, yes/no questions, tag questions) Subject – verb agreement, use of articles, preposition and conditionals – impersonal passive – error detection and punctuation

UNIT III   RECEPTIVE SKILLS 1 & 2 – LISTENING AND READING   12
Gap filling activity while listening - intensive listening – listening to a discourse and filling up gaps in a worksheet – comprehension tasks based on listening. Reading the gist to identify the topic sentence – its role – sequencing of sentences – transcoding diagrams – understanding discourse coherence and cohesion

UNIT IV   PRODUCTIVE SKILL 1 – SPEAKING   12
 Making Oral presentations – planning, kinds of presentation – adapting your ideas to audience, planning visual and other device to involve the audience – conducting language games to enrich spoken skills – facing interviews and negotiating benefits.

UNIT V   PRODUCTIVE SKILL 2 – WRITING   12
One sentence definition of technical terms – descriptions, paragraph writing, process description, check list, job application & resume, business letters (Calling for quotation, placing orders, enquiry etc) – Instruction and recommendation

TOTAL: 60 PERIODS

REFERENCES:
1   Kitty O Locker, "Business Communication – Building critical Skills", Mc-Graw Hill, Third Edition 2007
2   Bridha Prabhakar, G.   Subramanian, "Technical   English   for Engineering
    Students", Gems Publications, 2006.
3   Aysha Viswamohan, "English for Technical Communication", Tata McGraw Hill, 2007

YMA002   **APPLIED MATHEMATICS - II**   **L   T   P   C**
                                                                             3   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-NecessaryCondition-CauchyRiemann equation–Sufficient condition (excluding proof) -Properties of analytic functions– Harmonicconjugate-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 andformula-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– Transformof Periodic function-InverseLaplace transform- Convolution theorem- Solution of linear ODE of second order with constant co- efficient, using Laplace transformation

                                        LECTURE:45TUTORIALS:15 TOTAL: 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)

YCS923	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 – Shellsort –Heapsort– Mergesort–Quicksort– External Sorting

UNIT V   GRAPHS   9

Definitions– Topological Sort– Shortest-Path Algorithms–Unweighted Shortest Paths– Dijkstra's Algorithm– Minimum Spanning Tree– Prim's Algorithm– Applications of Depth-First Search–Undirected Graphs –Biconnectivity– Introduction to NP-Completeness

TOTAL : 45

REFERENCES:
1 R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2 M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed, 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", ThomsonBrooks / COLE, 1998.

YCA921　　　　　　　　　**MICROPROCESSORS**　　　　　　　　**L T P C**
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　3 0 0 3

UNIT I　　　　　　　　　　　　　　　　　　　　　　　　　　　　**9**

8085 Microprocessor:The 8085 MPU– Architecture – Instruction formats – Addressing modes – Instruction set – Programming with 8085 – 8085 based microcomputer system.

UNIT II　　　　　　　　　　　　　　　　　　　　　　　　　　　**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　　　　　　　　　　　　　　　　　　　　　　　　　　**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　　　　　　　　　　　　　　　　　　　　　　　　　　**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　　　　　　　　　　　　　　　　　　　　　　　　　　**9**

Advanced Processors:Intel's 80X86 family of processors – Salient features of 80286,

80386, 80486 and the Pentium Processors.

　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　TOTAL: 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.

YCA922   **ELEMENTS OF COMMERCE**   **L P T C**
                                                                                            3 0 0 3

To enhance the students with practical knowledge of commerce, book keeping and accounting.

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: 45 PERIODS

REFERENCES :
1   Jain and Nearing," Advanced Accounting", Kalian 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.

YCS927　　　　　**DATA STRUCTURES LABORATORY**　　　　**L　T　P　C**
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　0　0　3　2

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 Paranthesis'

(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 Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)

7. Implement the application for checking 'Balanced Paranthesis' 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

TOTAL: 45 PERIODS

YCA928   **MICROPROCESSORS LAB**   **L   T   P   C**
                                                                        0   0   3   2

LIST OF EXERCISES

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.

                                                              TOTAL: 45 PERIODS

YCA929	**ACCOUNTING LABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

Objective: To enhance the accounting knowledge by applying software

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

TOTAL: 45 PERIODS

YMA011   **APPLIED MATHEMATICS III**   **L T P C**
                                                                      3 1 0 4

UNIT I   PARTIAL DIFFERENTIAL EQUATIONS   9 + 3
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   9 + 3
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   9 + 3
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   9 + 3
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   9 + 3
Z-transform - Elementary properties – Inverse Z – transform – Convolution theorem -Formation of difference equations – Solution of difference equations using Z - transform.

Lecture: 45   Tutorials: 15 Total: 60 PERIODS

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.

YCS935   **ALGORITHM DESIGN TECHNIQUES**   **L   T   P   C**
                                                                                        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 – Traveling salesman problem.

UNIT V   NP-HARD AND NP-COMPLETE PROBLEMS   9

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

TOTAL : 45 PERIODAS

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.

YCA934   **SOFTWARE ENGINEERING**   **L   T   P   C**
                                                                         3   0   0   3

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 modeling – data, functional and behavioral 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 : 45 PERIODS

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 Pedryez, "Software Engineering – An Engineering Approach",
    John Wiley and Sons, New Delhi, 2000.

YCA931   **OBJECT ORIENTED PROGRAMMING**   **L   T   P   C**
                                                                3   0   0   3

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: 45 PERIODS

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.
6. E.Balagurusamy " Object Oriented Programming with C++", TMH 2/e

YCS924   **COMPUTER ARCHITECTURE**   **L T P C**

                                                                          3 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 – Microprogrammed 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: 45 PERIODS

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.

YIT938   **ALGORITHMS DESIGN LABORATORY**   **L T P C**
                                                                            0 0 3 2

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 traveling 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 traveling salesperson problem using backtracking

TOTAL: 45 PERIODS

YCA933   OBJECT ORIENTED PROGRAMMING LABORATORY   L T P C
0 0 3 2

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: 45 PERIODS

YCT942   **SOFTWARE ENGINEERING LABORATORY**   **L   T   P   C**
                                                                 0   0   3   2

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 : 45 PERIODS

YMA005 **NUMERICAL METHODS** **L   T   P   C**
                                      3   1   0   4

UNIT   SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS   9+3
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 – Eigenvalue of a matrix by power method.

UNIT II   INTERPOLATION AND APPROXIMATION   9+ 3
Lagrangian Polynomials – Divided differences – Interpolating with a cubic spline – Newton's forward and backward difference formulas.

UNIT III   NUMERICAL DIFFERENTIATION AND INTEGRATION   9+ 3
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   9+ 3
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   9+ 3
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.

TUTORIAL 15 TOTAL : 60 PERIODS

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 Pub.Co.Ltd, New Delhi, 1999.
4. Burden, R.L and Faires, T.D., "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002

YCS942   **OPERATING SYSTEMS**   L   T   P   C
                                                             3   0   0   3

UNIT I   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   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   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   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   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 :45 PERIODS

REFERENCE BOOKS

1. Abraham Silberschatz, 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.

YCS951   **COMPUTER NETWORKS**   **L**   **T**   **P**   **C**
                                                                           3   **0**   **0**   **3**

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 : 45 PERIODS

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.

YCS932   **PRINCIPLES OF DATA COMMUNICATION**   L   T   P   C
                                                                    3   0   0   3

UNIT I   BASICS OF COMMUNICATION   9
Basics of AM, FM and PM Block Diagram, Concepts of AM, FM modulators and demodulators -
Pulse modulation systems - Pulse amplitude modulation - Sampling, Quantisation, Quantisation
error.

UNIT I I   INFORMATION THEORY & CODING   9
Discrete Messages - Concepts of entropy and information rate - Shannon's theorem - channel
capacity - Orthogonal signals and their use - Introduction to coding - Coding and Decoding -
Algebraic codes, burst error correction codes - Convolution coding and decoding .

UNIT I II   DATA TRANSMISSION CONCEPTS   9
Concepts and Terminology- Analog and Digital transmission, Transmission impairments -
Transmission media - Synchronous/Asynchronous transmission - Line Configurations -
interfacing.

UNIT I V   DATA ENCODING   9

Digital data Digital signals - Variations of NRZ and biphase - Digital data Analog signals - ASK,
FSK, PSK, QPSK - Analog Data Digital signals - PCM, DM.

UNIT V   DATA LINK CONTROL   9

Flow control, Error control - HDLC, Multiplexing.

                                                              TOTAL : 45 PERIOdS

REFERENCES :

1. Taub and Schilling, "Principles of Communication Systems", Tata Mc Graw Hill Pub. Co.,
    New Delhi, 2002.
2. William Stallings, "Data and Computer Communications", Sixth Edition, Pearson Education,
    Prentice Hall of India, New Delhi, 2002.
3. Prakash C. Gupta, "Data Communications", Prentice Hall of India, New Delhi, 2002

YCS953   **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 Modeling transformations – Viewing - Parallel and perspective projections.

UNIT V   IREMOVAL OF HIDDEN SURFACES   9
Visible Surface Detection Methods – Computer Animation.

TOTAL: 45 PERIODS

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.

YCT941   **OPERATING SYSTEM LAB**   L   T   P   C
                                                             0   0   3   2

(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, opendir, readdir

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: 45 PERIODS

YCS957   **COMPUTER NETWORKS LABORATORY**   **L   T   P   C**
                                                              0   0   3   2

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

TOTAL: 45 PERIODS

YCT952　　　**COMPUTER GRAPHICS LABORATORY**　　　**L　T　P　C**
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　0　0　3　2

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: 45 PERIODS

YCS954   **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 AUTHORING TOOLS   9
Multimedia Hardware: Macintosh and Windows production platforms-Hardware Peripherels:
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 :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.

YCS942   **INTERNET PROGRAMMING**   L   T   P   C
                                                                      3   0   0   3

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 : 45 PERIODS
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 AgeInternational
    Publishers, 2004.
4. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata
5. McGraw Hill, 2003.
6. Naughton, "The Complete Reference – Java2", Tata McGraw-Hill, 3rd edition, 1999.

YCS944   **COMPILER DESIGN**   **L   T   P   C**
                                                                      3   0   0   3

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 **–** ecursive 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 : 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.

YSE956 **MULTIMEDIA SYSTEMS LAB** **L T P C**
0 0 3 2

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: 45 PERIODS

YCS946   **INTERNET PROGRAMMING LAB**   **L T P C**
                                                       0 0 3 2

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:
    *   Create a color palette with matrix of buttons
    *   Set background and foreground of the control text area by selecting a color from color palette.
    *   In order to select Foreground or background use check box control as radio buttons
    *   To set background images
4. Write programs in Java to do the following.
    *   Set the URL of another server.
    *   Download the homepage of the server.
    *   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:
    *   HTTP request
    *   FTP
    *   SMTP
    *   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:
    *   To invoke servlets from HTML forms
    *   To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
    *   for conducting on-line examination.
    *   for displaying student mark list. Assume that student information is available in adatabase which has been stored in a database server.
9. Create a web page with the following using HTML
    i)   To embed a map in a web page
    ii) To fix the hot spots in that map
    iii) Show all the related information when the hot spots are clicked.
10. Create a web page with the following.
    i)   Cascading style sheets.
    ii) Embedded style sheets.
    iii) Inline style sheets.
    iv) Use your college information for the web pages.

                                                       TOTAL: 45 PERIODS

YCA947   **COMPILER DESIGN LAB**   **L T P C**
                                                                    0 0 3 2

1 & 2 Implement a lexical analyzer in "C".

3. Use LEX tool to implement a lexical analyzer.

4. Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.

5. Use YACC and LEX to implement a parser for the same grammar as given in problem

6. 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.

7 & 8. 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.

9 &10. 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: 45 PERIODS

SEMESTER VI

YCA961   **CRYPTOGRAPHY AND NETWORK SECURITY**   **L T P C**
                                                                                    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 : 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.

YCA962   **DATA MINING**   **L   T   P   C**
                                                                              3   0   0   3

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 : 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", MeGraw-Hill Edition, 2001.
7. Paulraj Ponniah, "Data Warehousing Fundamentals", Wiley-Interscience Publication, 2003.

LIST OF ELECTIVES

YCS962   **INFORMATION SECURITY**   **L T P C**
3 0 0 3

UNIT I   INTRODUCTION   9
History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II   SECURITY INVESTIGATION   9
Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III   SECURITY ANALYSIS   9
Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV   LOGICAL DESIGN   9
Blueprint for Security, Information Security Poicy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V   PHYSICAL DESIGN   9
Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

TOTAL : 45

REFERENCES

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003
2. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
3. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
4. Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.

YCS002   **MANAGEMENT INFORMATION SYSTEMS**   **L T P C**
                                                                3 0 0 3

UNIT I   INFORMATION SYSTEM AND ORGANIZATION   9
Matching the Information System Plan to the Organizational Strategic Plan – Identifying Key Organizational Objective and Processes and Developing an Information System Development – User role in Systems Development Process – Maintainability and Recoverability in System Design.

UNIT II   REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE   9
Models for Representing Systems: Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics – Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

UNIT III   SYSTEMS, INFORMATION AND DECISION THEORY   9
Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty – Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

UNIT IV   INFORMATION SYSTEM APPLICATION   9
Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning – Other use of Information Technology: Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

UNIT V   DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS   9
Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off– the shelf software packages – Outsourcing – Comparison of different methodologies.

                                                                TOTAL = 45

TEXT BOOKS:
1. Laudon K.C, Laudon J.P, Brabston M.E, "Management Information Systems - Managing the digital firm", Pearon Education, 2004.

REFERENCES:
1. Turban E.F, Potter R.E, "Introduction to Information Technology"; Wiley, 2004.
2. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, "Modern Systems Analysis and Design", Third Edition, Prentice Hall, 2002.

YCA001   **ADVANCED COMPUTER ARCHITECTURE**   **L T P C**
                                                                3 0 0 3

UNITI   INTRODUCTION   9
Fundamentals of Computer Design – Measuring and reporting performance –
Quantitative principles of computer design. Instruction set principles – Classifying ISA – Design issues. Pipelining – Basic concepts – Hazards – Implementation – Multicycle operations.

UNIT II   INSTRUCTION LEVEL PARALLELISM WITH DYNAMIC APPROACHES   9
Concepts – Dynamic Scheduling – Dynamic hardware prediction – Multiple issue – Hardware based speculation – Limitations of ILP.

UNIT III   INSTRUCTION LEVEL PARALLELISM WITH SOFTWARE
                   APPROACHES   9
Compiler techniques for exposing ILP – Static branch prediction – VLIW – Advanced compiler support – Hardware support for exposing more parallelism – Hardware versus software speculation mechanisms.

UNIT IV   MEMORY AND I/O   9
Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time – Main memory and performance – Memory technology. Types of storage devices – Buses – RAID – Reliability, availability and dependability – I/O performance measures – Designing an I/O system.

UNIT V   MULTIPROCSSORS AND THREAD LEVEL PARALLELISM   9
Symmetric and distributed shared memory architectures – Performance issues – Synchronization – Models of memory consistency – Multithreading.

                                                           TOTAL : 45

REFERENCES

1. John L. Hennessey and David A. Patterson, "Computer Architecture: A Quantitative Approach", Morgan Kaufmann, 2003, Third Edition.

2. D.Sima, T.Fountain and P.Kacsuk, "Advanced Computer Architectures: A Design Space Approach", Addison Wesley, 2000.

3. Kai Hwang and Zhi.Wei Xu, "Scalable Parallel Computing", Tata McGraw-Hill, New Delhi, 2003.

YCA002   **ADVANCED OPERATING SYSTEMS**   **L T P C**
                                                                  3 0 0 3

UNIT I   9
Architectures of Distributed Systems - System Architecture types - issues in distributed operating systems - communication networks – communication primitives. Theoretical Foundations - inherent limitations of a distributed system – lamp ports logical clocks – vector clocks – casual ordering of messages – global state – cuts of a distributed computation – termination detection. Distributed Mutual Exclusion – introduction – the classification of mutual exclusion and associated algorithms – a comparative performance analysis.

UNIT II   9
Distributed Deadlock Detection -Introduction - deadlock handling strategies in distributed systems – issues in deadlock detection and resolution – control organizations for distributed deadlock detection – centralized and distributed deadlock detection algorithms –hierarchical deadlock detection algorithms. Agreement protocols – introduction-the system model, a classification of agreement problems, solutions to the Byzantine agreement problem, applications of agreement algorithms. Distributed resource management: introduction-architecture – mechanism for building distributed file systems – design issues – log structured file systems.

UNIT III   9
Distributed shared memory-Architecture– algorithms for implementing DSM – memory coherence and protocols – design issues. Distributed Scheduling – introduction – issues in load distributing – components of a load distributing algorithm – stability – load distributing algorithm – performance comparison – selecting a suitable load sharing algorithm – requirements for load distributing -task migration and associated issues. Failure Recovery and Fault tolerance: introduction– basic concepts – classification of failures – backward and forward error recovery, backward error recovery- recovery in concurrent systems – consistent set of check points – synchronous and asynchronous check pointing and recovery – check pointing for distributed database systems recovery in replicated distributed databases.

UNIT IV   9
Protection and security -preliminaries, the access matrix model and its implementations.-safety in matrix model- advanced models of protection. Data security – cryptography: Model of cryptography, conventional cryptography- modern cryptography, private key cryptography, data encryption standard- public key cryptography – multiple encryptions – authentication in distributed systems.

UNIT V   9
Multiprocessor operating systems - basic multiprocessor system architectures – inter connection networks for multiprocessor systems – caching – hypercube architecture. Multiprocessor Operating System - structures of multiprocessor operating system, operating system design issues- threads- process synchronization and scheduling. Database Operating systems :Introduction- requirements of a database operating system Concurrency control : theoretical aspects – introduction, database systems – a concurrency control model of database systems-the problem of concurrency control – serializability theory- distributed database systems, concurrency control algorithms – introduction, basic synchronization primitives, lock based algorithms-timestamp based algorithms, optimistic algorithms – concurrency control algorithms, data replication.

REFERENCES

1. Mukesh Singhal, Niranjan G.Shivaratri, "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", TMH, 2001
2   Andrew S.Tanenbaum, "Modern operating system", PHI, 2003
3. Pradeep K.Sinha, "Distributed operating system-Concepts and design", PHI, 2003.
4. Andrew S.Tanenbaum, "Distributed operating system", Pearson education, 2003

YES005   **CLIENT SERVER COMPUTING**   **L   T   P   C**
                                                                  3   0   0   3

UNIT I   INTRODUCTION   9
Client Server Computing era, Real Client/Server, Fat Servers or fat clients, 2 tier Vs 2 tier, Intergalactic client server, client server for different models, building blocks

UNIT II   CLIENT/SERVER OPERATION SYSTEMS   9
Anatomy of Server programs, Server needs from OS, Server scalability, Client anatomy, Client needs from OS, Client OS trends, MAC OS, Linux OS, Win OS, Server OS trends, NetWare, Win 2000 Server, OS/2 warp server

UNIT III   CLIENT SERVER MIDDLEWARE   9
NOS 0Middleware, global directory services, X.500, LDAP, distributed time services, distributed security services, RPC messaging and peer to peer, Sockets, NetWare, NetBIOS, remote procedure call, messaging and queuing, MOM Vs RPC, Evolution of the NOS, DCE, The enterprise NOS, the internet as NOS

UNIT IV   CLIENT SERVER TRANSACTION PROCESSING   9
ACID properties, Transaction Models, TP Monitor, TP Monitor and OS, TP Monitor and Transaction Management, TP Monitor Client/ Server Interaction types, Transactional RPC, Queues, TP Lite or TP Heavy, TP Lite versus TP Heavy – Managing Heterogeneous networks, Process Management, client/server invocations, Performance

UNIT V   CLIENT SERVER AND INTERNET   9
Client server and internet, Web client server, 3 tier client server web style, CGI, the server side of web, CGI and State, SQL database servers, Middleware and federated databases, data warehouses, EIS/DSS to data mining, GroupWare Server, what is GroupWare, components of GroupWare

                                                                  TOTAL: 45

REFERENCES:

1. Robert Orfali, Dan Harkey & Jeri Edwards, "Essential Client/Server Survival Guide', second edition, John Wiley & Sons, Singapore, 2003
2. James E. Goldman, Phillip T. Rawles, Julie R. Mariga, " Client/Server Information Systems, A Business Oriented Aproach", John Wiley & Sons, Singapore, 2000.
3. Eric J Johnson, " A complete guide to Client/Server Computing", first edition, Prentice Hall, New Delhi, 2001.
4. Smith & Guengerich, "Client/Server Computing", Prentice Hall, New Delhi, 2002

YCS001   BUSINESS DATA PROCESSING   **L T P C**
                                                                            3 0 0 3

UNIT I   INTRODUCTION   9
Organizational behaviour- Foundations of Individual behavior-Perception and Individual decision making-values, attitude and job satisfaction.

UNIT II   GROUPS IN ORGANISATION   9
Foundations of group behaviour- Understanding work teams- Communication – Leadership.

UNIT III   ORGANISATION SYSTEM   9
Foundations of organization structure – Technology – Work design and stress – Human resource policies and practices – Organisational Culture.

UNIT IV   BUSINESS PROCESS RE-ENGINEERING AND IT   9
Basic concepts and the need for BPR-Principles of BPR and the role of IT- BPR and restructuring the organization.

UNIT V   NETWORK ORGANIZATIONS   9
Networked organization- virtual corporations.

                                                                            TOTAL 45

REFERENCES
1. Stephen P.Robbins "Organizational behavior", PHI, 12th edition, 2006.
2. Turban,Mclean,wetherbe,"Information Technology for management" John Wiely and Sons, 2001.
3. Ravi Kalakota and Marcia Robinson, "E-Business; Roadmap for Success; Pearson Education, 2000.
4. Vikram Sethi & William R King, " Organizational transformation through business process reengineering", Pearson education, 2006.

YCS004   **PC TESTING AND TROUBLE SHOOTING**   **L   T   P   C**
                                                                       3   0   0   3

UNIT I   **9**
PC Hardware Introduction and Overview : Personal computing History, Types of systems, Documentation – Technical Reference Manuals – Hardware Maintenance Manuals.
System Teardown and Inspection : Hand Tools, Soldering and Desoldering Tools, Loop Back Connectors, Meters, Logic Probes and Logic Pulsers, Outlet Tester and Chemicals, Disassembly Procedures.

UNIT II   **9**
Primary System Components : Types of Motherboards, ROM BIOS Compatibility. Bus Slots and I/O Cards. The Processor Bus, the Memory Bus and the Address Bus, Expansion Slots. Types of I/O Buses : The ISA Bus, EISA Bus, VESA Bus and PCI Bus. I/O port Addresses and DMA Channels.

PC System Memory : Base Memory, Upper Memory Area, Extended Memory, Expanded Memory, Total Installed Memory Versus Total Usable Memory. Physical Memory and Testing Memory.

UNIT III   **9**
Floppy Disk Drives : Types of Floppy Drives, Handling Recording Problems, Analysis Floppy Disk Construction, Drive Installation Procedure Trouble Shooting and Correcting Problems, Repairing Floppy Drives.
Hard Disk Drives : Hard disk Interfaces and Installation procedure Hard Disk Trouble Shooting and Repair.

UNIT IV   **9**
System Assembly and Maintenance : System upgrades – Upgrades system Memory, Speeding up a system, upgrading the DOS Version.
Preventive Maintenance : Active and Passive Preventive Maintenance Procedure – Power – Protection Systems – Surge suppressions, Phone line surge protectors, Line conditioners, Backup Power, dedicated data backup hardware.

UNIT V   **9**
Software and Hardware Diagnostic Tools: The power On self test (POST), General purpose Diagnostic Programs – AMI Diag, Checkit Pro-Norton Diagnostics, Qaplus, Norton utilities, Anti-Virus Tools.
Operating System and Trouble Shooting : DOS Components, The Basic process, How DOS Loads and starts, File Management, DOS File spared allocation, The DEBUG Program, Memory Resident Software Conflicts.

                                                                    TOTAL : 45

REFERENCES

1. Scott Mueller "Upgrading and Repairing PCs", 14th Edition, Pearson Education, New Delhi, 2002.
2. Govindaraju B. "IBM PC and Clones : Hardware, Trouble Shooting and Maintenance", 2nd Edition, Tata McGraw Hill Pub. Co., New Delhi, 2002.

YCS012   **MOBILE COMPUTING**   **L T P C**
                                                                      3 0 0 3

UNIT I   WIRELESS COMMUNICATION FUNDAMENTALS   9

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT II   TELECOMMUNICATION NETWORKS   11

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

UNIT III   WIRLESS LAN   9

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth.

UNIT IV   MOBILE NETWORK LAYER   9

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

UNIT V   TRANSPORT AND APPLICATION LAYERS   7

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0.

TOTAL : 45

REFERENCES

1. Jochen Schiller, "Mobile Communications", PHI/Pearson Education, Second Edition,2003.
   (Unit I Chap 1,2 &3- Unit II chap 4,5 &6-Unit III Chap 7.Unit IV Chap 8-Unit V Chap 9&10.)
2. William Stallings, "Wireless Communications and Networks", PHI/Pearson
   Education, 2002. (Unit I Chapter – 7&10-Unit II Chap 9)
3. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks",
   PHI/Pearson Education, 2003.
4. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile
   Computing", Springer, New York, 2003.

YCS015   **SOFTWARE PROJECT MANAGEMENT**   **L T P C**
     3 0 0 3

UNIT I   INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT   9
Project Definition – Contract Management – Activities Covered by Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II   PROJECT EVALUATION   9
Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation. – software effort Estimation

UNIT III   ACTIVITY PLANNING   9
Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning and Control.

UNIT IV   MONITORING AND CONTROL   9
Resource allocation - identifying and scheduling resources – publishing resource and cost schedule – scheduling sequence - Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Priortizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V   MANAGING PEOPLE AND ORGANIZING TEAMS   9
Introduction – Understanding Behavior – Organizational Behavior - Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team – Decision Making – Leadership – Organizational Structures – Stress – Health and Safety – Case Studies.

TOTAL = 45

TEXT BOOK:
1. Bob Hughes, Mikecotterell, "Software Project Management", Third Edition, Tata McGraw Hill, 2004.

REFERENCES:
1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, "Software Project Management", Pearson Education, 1999.
3. Jalote, "Software Project Management in Practice", Pearson Education, 2002.
4. Robert T. Futrell, Donald F. Shefer and Linda I. Shefer, "Quality Software Project Management", Pearson Education, 2003.

YCS003   **PROFESSIONAL ETHICS**   **L T P C**
                                                                             3 0 0 3

Unit I   ENGINEERING ETHICS   9
Senses of 'engineering ethics' – variety of moral issues – types of inquiry – moral dilemmas – moral autonomy – kohlberg's theory – gilligan's theory – consensus and controversy – professions and professionalism – professional ideals and virtues – theories about right action – self-interest – customs and religion – uses of ethical theories.

Unit II   ENGINEERING AS SOCIAL EXPERIMENTATION   9
Engineering as experimentation – engineers as responsible experimenters – codes of ethics – a balanced outlook on law – the challenger case study.

Unit III   ENGINEER'S RESPONSIBILITY FOR SAFETY   9
Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk – the three mile island and chernobyl case studies.

Unit IV   RESPONSIBILITIES AND RIGHTS   9
Collegiality and loyalty – respect for authority – collective bargaining – confidentiality – conflicts of interest – occupational crime – professional rights – employee rights – intellectual property rights (ipr) – discrimination

UNIT V   GLOBAL ISSUES   9
Multinational corporations – environmental ethics – computer ethics – weapons development – engineers as managers – consulting engineers – engineers as expert witnesses and advisors – moral leadership – sample code of conduct

                                                                   TOTAL : 45

REFERENCES:
1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York, 1996.
2. Charles D Fleddermann, "Engineering Ethics", prentice Hall, New Mexico, 1999.
3. Laura Schlesinger, "How Could You Do That: The Abdication of Character, Courage, and Conscience", Harper Collins, New York, 1996.
4. Stephen Carter, "Integrity", Basic Books, New York, 1996.
5. Tom Rusk, "The Power of Ethical Persuasion: From Conflict to Partnership at Work and in Private Life", Viking, New York, 1993

YCS008   **IMAGE PROCESSING**   **L T P C**
                                                                                      3 0 0 3

UNIT I   DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS   9

Elements of visual perception – Image sampling and quantization Basic relationship between pixels – Basic geometric transformations-Introduction to Fourier Transform and DFT – Properties of 2D Fourier Transform – FFT – Separable Image Transforms –Walsh – Hadamard – Discrete Cosine Transform, Haar, Slant – Karhunen – Loeve transforms.

UNIT II   IMAGE ENHANCEMENT TECHNIQUES   9

Spatial Domain methods: Basic grey level transformation – Histogram equalization – Image subtraction – Image averaging –Spatial filtering: Smoothing, sharpening filters – Laplacian filters – Frequency domain filters : Smoothing – Sharpening filters – Homomorphic filtering.

UNIT III   IMAGE RESTORATION: 9

Model of Image Degradation/restoration process – Noise models – Inverse filtering - Least mean square filtering – Constrained least mean square filtering – Blind image restoration – Pseudo inverse – Singular value decomposition.

UNIT IV   IMAGE COMPRESSION   9

Lossless compression: Variable length coding – LZW coding – Bit plane coding predictive coding-DPCM.
Lossy Compression: Transform coding – Wavelet coding – Basics of Image compression standards: JPEG, MPEG, Basics of Vector quantization.

UNIT V   IMAGE SEGMENTATION AND REPRESENTATION   9

Edge detection – Thresholding - Region Based segmentation – Boundary representation: chair codes- Polygonal approximation –Boundary segments –boundary descriptors: Simple descriptors-Fourier descriptors - Regional descriptors –Simple descriptors- Texture

TOTAL : 45

REFERENCES
1. Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.
2. William K Pratt, Digital Image Processing John Willey (2001)
3. Image Processing Analysis and Machine Vision – Millman Sonka, Vaclav hlavac, Roger Boyle, Broos/colic, Thompson Learniy (1999).
4. A.K. Jain, PHI, New Delhi (1995)-Fundamentals of Digital Image Processing. Chanda Dutta Magundar – Digital Image Processing and Applications, Prentice Hall of India, 2000

YCS007   **SOFTWARE TESTING**   **L T P C**
                                                                    3 0 0 3

UNIT I   INTRODUCTION   8
Testing as an Engineering Activity – Testing as a Process – testing axioms – Basic Definitions –
Software Testing Principles – The Tester's Role in a Software Development Organization –
Origins of Defects – cost of defects - Defect Classes – The Defect Repository and Test Design –
Defect Examples – Developer/Tester Support for Developing a Defect Repository – Defect
Prevention Strategies

UNIT II   TEST CASE DESIGN   11
Test Case Design Strategies – Using Black Box Approach to Test Case Design - Random
Testing – Requirements based testing – Boundary Value Analysis – Decision tables -
Equivalence Class Partitioning - State-based testing – Cause-effect graphing – Error guessing -
Compatibility testing – User documentation testing – Domain testing Using White Box Approach
to Test design – Test Adequacy Criteria – static testing vs. structural testing – code functional
testing - Coverage and Control Flow Graphs – Covering Code Logic – Paths – Their Role in
White–box Based Test Design – code complexity testing – Evaluating Test Adequacy Criteria.

UNIT III   LEVELS OF TESTING   9
The Need for Levels of Testing – Unit Test – Unit Test Planning –Designing the Unit Tests - The
Test Harness – Running the Unit tests and Recording results – Integration tests – Designing
Integration Tests – Integration Test Planning – Scenario testing – Defect bash elimination
System Testing – Acceptance testing – Performance testing - Regression Testing –
Internationalization testing – Ad-hoc testing - Alpha , Beta Tests – testing OO systems – Usability
and Accessibility testing – Configuration testing - Compatibility testing – Testing the
documentation – Website testing

UNIT IV   TEST MANAGEMENT   9
People and organizational issues in testing – organization structures for testing teams – testing
services - Test Planning – Test Plan Components – Test Plan Attachments – Locating Test
Items – test management – test process - Reporting Test Results – The role of three groups in
Test Planning and Policy Development – Introducing the test specialist – Skills needed by a test
specialist – Building a Testing Group.

UNIT V   TEST AUTOMATION   8
Software test automation – skills needed for automation – scope of automation – design and
architecture for automation – requirements for a test tool – challenges in automation - Test
metrics and measurements –project, progress and productivity metrics

                                                          TOTAL 45

REFERENCES:
1. Srinivasan Desikan and Gopalaswamy Ramesh, " Software Testing – Principles and
   Practices", Pearson education, 2006.
2. Ilene Burnstein, "Practical Software Testing", Springer International Edition, 2003.
3. Ron Patton, " Software Testing", Second Edition, Sams Publishing, Pearson education, 2007
4. Renu Rajani, Pradeep Oak, "Software Testing – Effective Methods, Tools and Techniques",
   Tata McGraw Hill, 2004
5. Aditya P. Mathur, "Foundations of Software Testing – Fundamental algorithms and
   techniques", Dorling Kindersley (India) Pvt. Ltd., Pearson Education, 2008

YCT006   **ARTIFICIAL INTELLIGENCE**   **L T P C**
                                                                                3 0 0 3

UNIT I   INTRODUCTION   9
Intelligent agents – agents and environments - good behavior – the nature of Environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies – avoiding repeated states – searching with partial information.

UNIT II   SEARCHING TECHNIQUES   9
Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

UNIT III   KNOWLEDGE REPRESENTATION   9
First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation – Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects

UNIT IV   LEARNING   9
Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data – Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

UNIT V   APPLICATIONS   9
Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction – Probabilistic language processing - Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

                                                                          TOTAL : 45

REFERENSES

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.
2. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
3. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw- Hill, 2003.

	L	**T**	**P**	**C**

YCS016 **DISTRIBUTED OPERATING SYSTEMS** **L T P C**
3 0 0 3

UNIT I INTRODUCTION 9
Fundamentals – evolution – System Models – Distributed operating System – Issues – Distributed Computing environment Message passing – Introduction – Features – Issues – Synchronization – Buffering – Message – Encoding – Decoding – Process addressing – Failure Handling.

UNIT II REMOTE PROCEDURE CALL 9
Introduction – Model – Transparency – Implementation – Stub Generation – Messages – Marshaling Arguments and results –server Management – Parameter passing Semantics – Call Semantics – Communication Protocols – Complicated RPC's – Client – Server Binding – Exception handling – Security Distributed shared Memory – Introduction – Architecture – Issues – Granularity Structure – Consistency Models – Replacement Strategy – Thrashing.

UNIT III SYNCHRONIZATION 9
Introduction – Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock –Election Algorithms.

UNIT IV RESOURCE MANAGEMENT 9
Introduction – Features – Task Assignment approach – Load-Balancing Approach - Load - Sharing Approach Process Management – Introduction – Process Migration – Threads.

UNIT V DISTRIBUTED FILE SYSTEMS 9
Introduction – Features – File Models – Accessing Models – Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles Naming – Introduction – Features – Terminologies – Concepts.

TOTAL : 45

REFERENCES:

1. Pradeep K. Sinha, "Distributed Operating Systems, Concepts and Design" Prentice Hall of India, New Delhi, 2001.
2. Andrew S. Tanenbaum "Distributed Operating Systems", Pearson Education, New Delhi, 2002
3. Mukesh Singhal and Nirajan G.Shivaratri "Advanced Concepts in Operating Systems", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2001

YCS010	**DECISION SUPPORT SYSTEMS**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

UNIT I   DECISION-MAKING AND COMPUTERIZED SUPPORT   9

Management Support Systems: An Overview, Decision Making, Systems, Modeling, and Support.

UNIT II   DECISION SUPPORT SYSTEMS   9

An Overview, Data Management: Warehousing, Access, and Visualization , Modeling and Analysis , Knowledge based Decision Support and Artificial Intelligence , User Interface and Decision Visualization Applications , Constructing a Decision Support System and DSS Research.

UNIT III   COLLABORATION, COMMUNICATION, AND ENTERPRISE   9
SUPPORT SYSTEMS

Networked Decision Support: The Internet, Intranets, and Collaborative Technologies, Group Decision Support Systems, Executive Information and Support Systems.

UNIT IV   FUNDAMENTALS OF EXPERT SYSTEMS AND INTELLIGEN SYSTEMS   9

Fundamentals of Expert Systems, Knowledge Acquisition and Validation, Knowledge Representation, Inferences, Explanations, and Uncertainty, Building Expert Systems: Process and Tools.

UNIT V   CUTTING-EDGE DECISION SUPPORT TECHNOLOGIES   9

Neural Computing: The Basics, Neural Computing Applications, Genetic Algorithms, Fuzzy Logic, and Hybrid Intelligent Systems , Intelligent Agents and Creativity , Implementing and Integrating Management Support Systems , Organizational and Societal Impacts of Management Support Systems.

TOTAL : 45

REFERENCES:
1. Efraim Turban, Jay E. Aronson, "Decision Support Systems and Intelligent Systems", Prentice Hall, New Delhi, 2004
2. George Marakas, "Decision Support Systems in the 21st Century", Prentice Hall, New Delhi,   2003
3. Robert J Thierauf, "User Oriented Decision Support Systems", Prentice Hall, New Delhi, 1998

YCS017   **FUZZY LOGIC**   **L   T   P   C**
                                                            3   0   0   3

UNIT I   **9**
Introduction – Background – Uncertainty and Imprecision – Statistics and Random Processes – Uncertainly in Information – Fuzzy Sets and Membership – Chance versus Ambiguity – Classical Sets and Fuzzy Sets – Classical Sets – Fuzzy Sets – Sets as Points in Hypercubes.

UNIT II   **9**
Classical Relations and Fuzzy Relations – Cartesian product – Crisp Relations – Fuzzy Relations – Tolerance and Equivalence Relations – Fuzzy Tolerance and Equivalence Relations – Value Assignments.

UNIT III   **9**
Membership Functions – Features of the Membership Functions – Standard Forms and Boundaries – Fuzzification – Membership Value Assignments – Fuzzy to Crisp Conversions – Lambda Cuts for Fuzzy Sets – Lambda Cut for Fuzzy Relations – Defuzzification Methods – Summary – References – Problems.

UNIT IV   **9**
Fuzzy Arithmetic, Numbers, Vectors and the Extension Principle – Extension Principle – Fuzzy Numbers – Interval Analysis in Arithmetic – Approximate Methods of Extension – Fuzzy Vectors – Classical Logic and Fuzzy logic – Classical Predicate Logic – Fuzzy Logic – Approximate Reasoning – Fuzzy Tautologies, contradictions, Equivalence, and Logical Proofs – other Forms of the Implication Operation – Other Forms of the Composition Operation.

UNIT V   **9**
Fuzzy Rule Based systems – Natural Language – Linguistic Hedges – Rules Based Systems – Graphical Techniques of Inference – Fuzzy Classification - Classification by Equivalence Relations – Cluster Analysis – cluster Validity – c-Means Clustering – Classification Metric – Hardening the Fuzzy c-Partition – Similarity Relations from Clustering.

REFERENCE :

1. Timothy J Ross, "Fuzzy Logic with Engineering Applications", McGraw – Hill, Inc, 1995.