

2007-08

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
ANANTAPUR**

B.TECH. COMPUTER SCIENCE AND SYSTEMS ENGINEERING

III Year

I Semester

COURSE STRUCTURE

Code	Subject	T	P	C
	Optimization Techniques	4+1*	-	4
	Automata and Compiler Design	4+1*	-	4
	Unix Programming	4+1*	-	4
	Systems Programming	4+1*	-	4
	Computer Graphics	4+1*	-	4
	Operating Systems	4+1*	-	4
	Advanced English Communications Skills Lab	-	3	2
	Unix Programming and Compiler Design Lab	-	3	2
	TOTAL	30	6	28

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B.TECH. COMPUTER SCIENCE AND SYSTEMS ENGINEERING

IV Year

I- Semester

COURSE STRUCTURE

Code	Subject	T	P	C
	Multimedia and Application Development	4+1*	-	4
	Embedded Systems	4+1*	-	4
	Performance Evaluation of Computer Systems	4+1*	-	4
	Computer Systems Maintenance	4+1*	-	4
	Elective - I	4+1*	-	4
	Network Management Systems			
	Information Security			
	Human Computer Interface			
	Elective - II	4+1*	-	4
	Advanced Computing Concepts			
	Distributed Databases			
	Neural Networks			
	Embedded Systems Lab	-	3	2
	Multimedia and Application Development Lab	-	3	2
	TOTAL	30	6	28

NOTE: All University Examinations (Theory and Practical) are of 3 hours duration.

* : Tutorials

T : Theory periods per week P: Practical /Drawing Periods per week

C : Total Credits for the subject

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III Year B. Tech CSSE I-SEM

T	P	C
4+1*	0	4

OPTIMIZATION TECHNIQUES

UNIT – I Introduction and Classical Optimization Techniques:

Statement of an Optimization problem – design vector – design constraints – constraint surface – objective function – objective function surfaces – classification of Optimization problems.

UNIT – II Classical Optimization Techniques

Single variable Optimization – multi variable Optimization without constraints – necessary and sufficient conditions for minimum/maximum – multivariable Optimization with equality constraints.

Solution by method of Lagrange multipliers – multivariable Optimization with inequality constraints – Kuhn – Tucker conditions.

UNIT – III Linear Programming

Standard form of a linear programming problem – geometry of linear programming problems – definitions and theorems – solution of a system of linear simultaneous equations – pivotal reduction of a general system of equations – motivation to the simplex method – simplex algorithm.

UNIT – IV Transportation Problem

Finding initial basic feasible solution by north – west corner rule, least cost method and Vogel's approximation method – testing for optimality of balanced transportation problems.

UNIT – V Unconstrained Nonlinear Programming:

One – dimensional minimization methods: Classification, Fibonacci method and Quadratic interpolation method

UNIT – VI Unconstrained Optimization Techniques

Univariate method, Powell's method and steepest descent method.

UNIT – VII Constrained Nonlinear Programming:

Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods. Introduction to convex Programming Problem.

UNIT – VIII Dynamic Programming:

Dynamic programming multistage decision processes – types – concept of sub optimization and the principle of optimality – computational procedure in dynamic programming – examples illustrating the calculus method of solution - examples illustrating the tabular method of solution.

TEXT BOOKS:

1. "Engineering optimization: Theory and practice"-by S. S.Rao, New Age International (P) Limited, 3rd edition, 1998.
2. "Introductory Operations Research" by H.S. Kasene & K.D. Kumar, Springer(India), Pvt .LTd.

REFERENCE BOOKS:

- 1 " Optimization Methods in Operations Research and systems Analysis" – by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
2. Operations Research – by Dr. S.D.Sharma.
3. "Operations Research : An Introduction" – by H.A. Taha, PHI Pvt. Ltd., 6th edition
4. Linear Programming – by G. Hadley

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AUTOMATA AND COMPILER DESIGN

UNIT-I:

Formal Language and Regular Expressions: Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools.

UNIT-II:

Context Free grammars and parsing: Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing

UNIT-III:

Bottom up parsing handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.

UNIT-IV:

Semantics: Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

UNIT-V:

Context Sensitive features – Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNIT-VI:

Run time storage: Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.

UNIT-VII:

Code optimization: Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

UNIT-VIII:

Code generation: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

TEXT BOOKS :

1. Introduction to Theory of computation. Sipser, 2nd Edition, Thomson.
2. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

REFERENCES :

1. Modern Compiler Construction in C , Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Thomson.

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UNIX PROGRAMMING

UNIT-I:

Unix utilities –1: Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

UNIT-II:

Unix utilities –2: Text processing utilities and backup utilities , detailed commands to be covered are cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

UNIT-III:

Problem solving approaches in Unix: Using single commands, using compound Commands, shell scripts, C programs, building own command library of programs.

UNIT-IV:

Working with the Bourne shell: what is a shell, shell responsibilities, pipes and input Redirection, output redirection, here documents, the shell as a programming language, shell meta characters, shell variables, shell commands, the environment, control structures, shell script examples.

UNIT-V:

Unix Internals-1 : Unix file structure, directories, files and devices, System calls, library functions, low level file access, usage of open, creat, read, write, close, lseek, stat, fstat, ioctl, umask, dup and dup2, the standard i/o (fopen, fopen, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putc, putchar, fgets, gets), formatted I/O, stream errors, streams and file descriptors, file and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd), Directory handling system calls (opendir, readdir, closedir, rewinddir, seekdir, telldir)

UNIT-VI:

Unix Internals –2: Process and Signals: What is process, process structure, starting new process, Waiting for a process, zombie process, process control, process identifiers, fork, Vfork, exit, wait, exec, Signal functions, unreliable signals, interrupted system Calls, kill and raise functions, alarm, pause functions, abort, system, sleep functions.

UNIT-VII:

Unix Internals –3: Data Management: Management of memory (malloc, free, realloc, calloc), File Locking (creating lock files, Locking regions, use of read/write locking, competing locks, other commands, deadlocks)

UNIT-VIII:

Unix Internals – 4: Inter-Process communication: Pipe, Process Pipes, the pipe call, parent-child process, named pipes: FIFOs, Semaphores, message queues and shared memory and applications of IPC.

TEXT BOOKS:

1. Unix the ultimate guide, Sumitabha Das, TMH.
2. Unix Network Programming, W.R.Stevens Pearson/PHI.

REFERENCES:

1. Advanced programming in the Unix environment, W.R.Stevens, Pearson education.
2. Unix system programming using C++, T.Chan, PHI.
3. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
4. Unix Internals The New Frontiers, U.Vahalia, Pearson Education.
5. Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson Education

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SYSTEMS PROGRAMMING

UNIT I

INTRODUCTION TO PC ARCHITECTURE (Intel Pentium) PC Hardware, Segments and Addressing, Registers. ASSEMBLY LANGUAGE BASICS Machine Addressing, Special DEBUG features, Data Definition Directives, Addressing Formats, COM Programs.

UNIT II

PROGRAM LOGIC AND CONTROL JMP, LOOP and Conditional Jump Instructions, Boolean operations, Shifting, Rotating.

UNIT III

KEYBOARD AND SCREEN PROCESSING String Operations, Arithmetic Operations and Table Processing, Searching, Sorting.

UNIT IV

MACRO WORKING AND LINKING, Macro definition, The LOCAL: Directive, Reception Directives, Conditional Directives, Intra-segment and Inter-segment Calls, Passing Parameters.

UNIT V

ADVANCED SCREEN AND KEYBOARD PROCESSING, BIOS Interrupt 10H for graphics and text, DOS Interrupt 21H and BIOS Interrupt 16H for Keyboard input, Extended Function Keys.

UNIT VI

DISK PROCESSING Disk Organization, File Allocation Table, File Control Block, Sequential Reading of a Disk File, Random Processing, Miscellaneous Disk Processing Features, File Handlers and Extended DOS functions,

UNIT VII

BIOS Disk Operations. DOS MEMORY MANAGEMENT Program Segment Prefix, DOS Memory Control, Program Loader, Program Overlays, Resident Programs.

UNIT VIII

ASSEMBLERS AND MACROPROCESSOR, Design of Assembler, Data, Structure, format of Databases, Algorithm, Macro instructions, Features of a Macro facility, A two-pass algorithm and a single pass algorithm. LOADERS, Compile-and-go Loaders, General Loader Schemes, Absolute, Relocating and Direct-linking loaders.

TEXT BOOKS

1. Peter Abel, IBM PC Assembly Language and Programming, Second Edition, PHI. (Chapters I to 18, 20 to 22).
2. John J Donovan, Systems Programming, McGraw Hill.(Chapters 3,4,and 5).

REFERENCE:

- 1) Operating Systems and Systems Programming, Dhamdhare, PHI.

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COMPUTER GRAPHICS

UNIT-I:

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices (p.nos 22-90 of text book-1).

UNIT-II:

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundaryfill and flood-fill algorithms (p.nos 103-123, 137-145, 147-150, 164-171 of text book- 1, p.nos. 72-99 of text book-2).

UNIT-III:

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems (p.nos 204-227 of text book-1).

UNIT-IV:

2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm (p.nos 237-249, 257-261 of text book -1, p.nos. 111-126 of text book-2).

UNIT-V:

3-D object representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and BSpline surfaces. Basic illumination models, polygon rendering methods. (p.nos 324-331, 340-342, 347-364, 516-531, 542-546 of text book-1, p.nos 473-529, 721- 739 of text book-2).

UNIT-VI:

3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3-D viewing : Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping (p.nos 427-443, 452-481 of text book -1).

UNIT-VII:

Visible surface detection methods : Classification, back-face detection, depthbuffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods (p.nos 489-505 of text book -1, Chapter 15 of text book-2).

UNIT-VIII:

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications. (p.nos 604-616 of text book -1, chapter 21 of text book-2)

TEXT BOOKS:

1. "Computer Graphics *C version*", Donald Hearn and M.Pauline Baker, Pearson Education
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCES:

1. "Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.
2. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.
3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
4. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.
6. Computer Graphics, Steven Harrington, TMH

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OPERATING SYSTEMS

UNIT I :

Computer System and Operating System Overview: Overview of computer operating systems operating systems functions protection and security distributed systems special purpose systems operating systems structures and systems calls operating systems generation

UNIT II :

Process Management – Process concepts threads, scheduling-criteria algorithms, their evaluation, Thread scheduling, case studies UNIX, Linux, Windows

UNIT III :

Concurrency : Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Linux, Windows

UNIT IV :

Memory Management : Swapping, contiguous memory allocation, paging, structure of the page table , segmentation, virtual memory, demand paging, page-Replacement, algorithms, case studies UNIX, Linux, Windows

UNIT V :

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock,
I/O systems, Hardware, application interface, kernel I/O subsystem, Transforming I/O requests Hardware operation, STREAMS, performance.

UNIT VI :

File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

File System implementation- File system structure, file system implementation, directory implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows

UNIT VII :

Mass-storage structure overview of Mass-storage structure, Disk structure, disk attachment disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

UNIT VIII :

Protection : Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability-Based systems, Language – Based Protection,

Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications, case studies UNIX, Linux, Windows

TEXT BOOKS :

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating systems- A Concept based Approach-D.M.Dhamdhere, 2nd Edition, TMH

REFERENCES :

1. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

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ADVANCED ENGLISH COMMUNICATION SKILLS LAB

1. Introduction

The introduction of the English Language Lab is considered essential at 3rd year level. At this stage the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

- Gather ideas and information, to organise ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. Objectives:

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.

3. Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:

The English Language Lab shall have two parts:

- i) **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- ii) **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

- i) P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii) Headphones of High quality

5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

Suggested Software:

- **Clarity Pronunciation Power** – part II

- **Oxford Advanced Learner's Compass**, 7th Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE**(KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
 - **Preparing for being Interviewed,**
 - **Positive Thinking,**
 - **Interviewing Skills,**
 - **Telephone Skills,**
 - **Time Management**
 - **Team Building,**
 - **Decision making**

- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

6. Books Recommended:

1. **Effective Technical Communication**, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. **A Course in English communication** by Madhavi Apte, Prentice-Hall of India, 2007.
3. **Communication Skills** by Leena Sen, Prentice-Hall of India, 2005.
4. **Academic Writing- A Practical guide for students** by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
5. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
6. **Body Language- Your Success Mantra** by Dr. Shalini Verma, S. Chand, 2006.
7. **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice**, New Age International (P) Ltd., Publishers, New Delhi.
8. Books on **TOEFL/GRE/GMAT/CAT** by Barron's/cup
9. **IELTS series with CDs** by Cambridge University Press.
10. **Technical Report Writing Today** by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
11. **Basic Communication Skills for Technology** by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
12. **Communication Skills for Engineers** by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
13. **Objective English** by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
14. **Cambridge Preparation for the TOEFL Test** by Jolene Gear & Robert Gear, 4th Edition.
15. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

DISTRIBUTION AND WEIGHTAGE OF MARKS:

Advanced Communication Skills Lab Practicals:

1. The practical examinations for the English Language Laboratory practice shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the English Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 End Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned with the help of another member of the staff of the same department of the same institution.

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UNIX PROGRAMMING AND COMPILER DESIGN LAB

Objectives:

- To teach students various unix utilities and shell scripting
- To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavour of Unix / Linux
- C++ compiler and JDK kit

PART A

2. Write a shell script that copies multiple files to a directory.
3. Write a shell script which counts the number of lines and words present in a given file.
4. Write a shell script which displays the list of all files in the given directory.
5. Write a shell script (small calculator) that adds, subtracts, multiplies and divides the given two integers. There are two division options: one returns the quotient and the other returns remainder. The script requires 3 arguments: The operation to be used and two integer numbers. The options are add(-a), subtract(-s), multiply(-m), quotient(-c) and remainder(-r).
6. Write a shell script to reverse the rows and columns of a matrix.
7. Write a C program that counts the number of blanks in a text file.
 - a) using standard I/O
 - b) using system calls.
8. Implement in C the following Unix commands using system calls.
 - a) cat
 - b) ls
 - c) mv
9. Write a program that takes one or more file/directory names as command line input and reports the following information on the file:
 - c) File type.
 - d) Number of links.
 - e) Time of last access.
 - f) Read, Write and Execute permissions.
10. Write a C program that illustrates how to execute two commands concurrently with a command pipe.
11. Write a C program that illustrates the creation of child process using fork system call.
12. Write a C program that displays the real time of a day every 60 seconds.
13. Write a C program that illustrates file locking using semaphores.
14. Write a C program that implements a producer-consumer system with two processes. (using semaphores)
15. Write a C program that illustrates inter process communication using shared memory system calls.
16. Write a C program that illustrates the following.
 - g) Creating a message queue.
 - h) Writing to a message queue.
 - i) Reading from a message queue.

PART-B

Objective: To provide an understanding of the language translation peculiarities by designing a complete translator for a mini language.

Consider the following mini Language, a simple procedural high-level language, only operating on integer data, with a syntax looking vaguely like a simple C crossed with Pascal. The syntax of the language is defined by the following BNF grammar:

```

<program> ::= <block>
<block> ::= { <variabledefinition> <slist> }
| { <slist> }
<variabledefinition> ::= int <vardeflist> ;
<vardeflist> ::= <vardec> | <vardec> , <vardeflist>

```

```

<vardec> ::= <identifier> | <identifier> [ <constant> ]
<slis> ::= <statement> | <statement> ; <slis>
<statement> ::= <assignment> | <ifstatement> | <whilestatement>
| <block> | <printstatement> | <empty>
<assignment> ::= <identifier> = <expression>
| <identifier> [ <expression> ] = <expression>
<ifstatement> ::= if <bexpression> then <slis> else <slis> endif
| if <bexpression> then <slis> endif
<whilestatement> ::= while <bexpression> do <slis> enddo
<printstatement> ::= print ( <expression> )
<expression> ::= <expression> <addingop> <term> | <term> | <addingop> <term>
<bexpression> ::= <expression> <relop> <expression>
<relop> ::= < | <= | == | >= | > | !=
<addingop> ::= + | -
<term> ::= <term> <multop> <factor> | <factor>
<multop> ::= * | /
<factor> ::= <constant> | <identifier> | <identifier> [ <expression> ]
| ( <expression> )
<constant> ::= <digit> | <digit> <constant>
<identifier> ::= <identifier> <letterordigit> | <letter>
<letterordigit> ::= <letter> | <digit>
<letter> ::= a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x|y|z
<digit> ::= 0|1|2|3|4|5|6|7|8|9
<empty> has the obvious meaning

```

Comments (zero or more characters enclosed between the standard C/Java-style comment brackets `_____`) can be inserted. The language has rudimentary support for 1-dimensional arrays. The declaration `_____` declares an array of three elements, referenced as `__`, `__` and `__`. Note also that you should worry about the scoping of names.

A simple program written in this language is:

```

{ int a[3],t1,t2;
t1=2;
a[0]=1; a[1]=2; a[t1]=3;
t2=-(a[2]+t1*6)/(a[2]-t1);
if t2>5 then
print(t2);
else {
int t3;
t3=99;
t2=-25;
print(-t1+t2*t3); /* this is a comment
on 2 lines */
}
endif
}

```

1. Design a Lexical analyzer for the above language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
2. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.
3. Design Predictive parser for the given language
4. Design LALR bottom up parser for the above language.
5. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree.
6. Write program to generate machine code from the abstract syntax tree generated by the parser. The following instruction set may be considered as target code. The following is a simple register-based machine, supporting a total of 17 instructions. It has three distinct internal storage areas. The first is the set of 8 registers, used by the individual instructions as detailed below, the second is an area used for the storage of variables and the third is an area used for the storage of program. The instructions can be preceded by a label. This consists of an integer in the range 1 to 9999 and the label is followed by a colon to separate it from the rest of the instruction. The numerical label can be used as the argument to a jump instruction, as detailed below. In the description of the individual instructions below, instruction argument types are specified as follows:

R

specifies a register in the form R0, R1, R2, R3, R4, R5, R6 or R7 (or r0, r1, etc.).

L

specifies a numerical label (in the range 1 to 9999).

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V

specifies a "variable location" (a variable number, or a variable location pointed to by a register - see below).

A

specifies a constant value, a variable location, a register or a variable location pointed to by a register (an indirect address). Constant values are specified as an integer value, optionally preceded by a minus sign, preceded by a `_` symbol. An indirect address is specified by an `_` followed by a register. So, for example, an A-type argument could have the form `4` (variable number 4), `#4` (the constant value 4), `r4` (register 4) or `@r4` (the contents of register 4 identifies the variable location to be accessed).

The instruction set is defined as follows:

LOAD A,R

loads the integer value specified by `_` into register `_`.

STORE R,V

stores the value in register `_` to variable `_`.

OUT R

outputs the value in register `_`.

NEG R

negates the value in register `_`.

ADD A,R

adds the value specified by `_` to register `_`, leaving the result in register `_`.

SUB A,R

subtracts the value specified by `_` from register `_`, leaving the result in register `_`.

MUL A,R

multiplies the value specified by `_` by register `_`, leaving the result in register `_`.

DIV A,R

divides register `_` by the value specified by `_`, leaving the result in register `_`.

JMP L

causes an unconditional jump to the instruction with the label `_`.

JEQ R,L

jumps to the instruction with the label `_` if the value in register `_` is zero.

JNE R,L

jumps to the instruction with the label `_` if the value in register `_` is not zero.

JGE R,L

jumps to the instruction with the label `_` if the value in register `_` is greater than or equal to zero.

JGT R,L

jumps to the instruction with the label `_` if the value in register `_` is greater than zero.

JLE R,L

jumps to the instruction with the label `_` if the value in register `_` is less than or equal to zero.

JLT R,L

jumps to the instruction with the label `_` if the value in register `_` is less than zero.

NOP

is an instruction with no effect. It can be tagged by a label.

STOP

stops execution of the machine. All programs should terminate by executing a `STOP` instruction.

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MULTIMEDIA AND APPLICATION DEVELOPMENT

UNIT-I

Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT-II

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT-III

Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class

UNIT-IV

Action Script II: Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions

UNIT-V

Application Development:An OOP Application Frame work, Using mponents with ActionScript MovieClip Subclasses.

UNIT VI

Multimedia data compression: Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT VII

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT-VIII

Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Mediaon- Demand(MOD).

TEXT BOOKS:

- 1) Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education
- 2) Essentials ActionScript 2.0, Colin Moock, SPD O,REILLY.

REFERENCES:

- 1) Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
- 2) Macromedia Flash MX Professional 2004 Unleashed, Pearson.
- 3) Multimedia and communications Technology, Steve Heath, Elsevier(Focal Press)
- 4) Multimedia Applications, Steinmetz, Nahrstedt, Springer.
- 5) Multimedia Basics by Weixel Thomson
- 6) Multimedia Technology and Applications, David Hilman , Galgotia

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EMBEDDED SYSTEMS

Unit I

Embedded Computing: Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. (Chapter I from Text Book 1, Wolf)

Unit II

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts. (Chapter 3 from Text Book 2, Ayala)

Unit III

Basic Assembly Language Programming Concepts : The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions. (Chapters 4,5 and 6 from Text Book 2, Ayala)

Unit IV

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts. (Chapter 7 and 8 from Text Book 2, Ayala)

Unit-V

Applications: Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. (Chapter 10 and 11 from Text Book 2, Ayala)

Unit VI

Introduction to Real – Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment (Chapter 6 and 7 from Text Book 3, Simon)

Unit VII

Basic Design Using a Real-Time Operating System: Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System. (Chapter 8,9,10 and 11 from Text Book 3, Simon)

Unit VIII

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example- Elevator Controller. (Chapter 8 from Text Book 1, Wolf)

TEXT BOOKS:

1. Computers and Components, Wayne Wolf, Elseveir.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.

REFERENCES :

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

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PERFORMANCE EVALUATION OF COMPUTER SYSTEMS

UNIT I

Introduction: Motivation, Probability Models; Sample Space, Events, Algebra Of Events, Graphical Methods of Representing Events, Probability Axioms, Discrete Random Variables, Random Variables and their Event Spaces, Distribution Functions, Special Discrete Distributions, Analysis of Program MAX, The probability generating function, Discrete Random Vectors, Independent Random variables, Continuous random variables, The Exponential Distribution, The reliability, failure density and hazard function, Some Important Distributions, Functions of a Random variable, Jointly distributed random variables, Order statistics

UNIT –II

Expectation: Moments, Expectation of Functions of More Than one Random Variable, Transform Methods, Moments and Transforms of some Important Distributions, Computation of Mean Time to Failure, Inequalities and Limit Theorems, Conditional distribution and conditional Expectation: Mixture distributions, Conditional Expectation, Imperfect Fault coverage and reliability. Stochastic Processes: Classification of Stochastic Processes, The Bernoulli Process, The Poisson Process, Renewal Processes, Availability Analysis, Random Incidence, Renewal Model of Program Behavior.

UNIT –III

Discrete- Parameter Markov Chains: Computation of n-step Transition Probabilities, State Classification and Limiting Distributions, Distribution of Times between state changes, Irreducible finite chains with Aperiodic states, The M/G/1 Queuing system, Discrete Parameter Birth-Death Processes, Finite Markov chains with absorbing states, Continuous-Parameter Markov chains: The Birth and Death Process, Other special cases of the Birth-Death Model, Non-Birth-Death Processes, Markov chains with absorbing states, Networks of Queues: Open Queuing Networks, Closed Queuing Networks, Non exponential Service-Time Distributions and Multiple Job Types, Non-Product-Form Networks.

UNIT –IV

Structures and Algorithms for Array Processors, SIMD Array Processors, AIMD Interconnection Networks, Parallel Algorithms for Array Processors, Associative Array Processing

UNIT –V

SMID Computers and performance Enhancement: The space of SMID computers, Array and Associative Processors, SIMD Computer Perspectives, The Illiac IV and the BSP Systems, The Illiac IV System Architecture, Applications of Illiac IV, The Massively Parallel Processor, The MPP System Architecture, Performance Enhancement Methods: Parallel Memory Allocation, Array Processing Languages, Performance Analysis of Array Processor4s, Multiple-SMID Computer Organization.

UNIT –VI

Multiprocessor Architecture and Programming, Functional Structures, Interconnection Networks, Parallel Memory Organizations, Multiprocessor Operation Systems, Exploiting Concurrency for Multiprocessing

UNIT –VII

Multiprocessing Control and Algorithm, Inter-process Communication Mechanisms, System Deadlocks and Protection, Multiprocessor Scheduling Strategies, Parallel Algorithms for Multiprocessors

UNIT –VIII

Example Multiprocessor Systems, The Space of Multiprocessor Systems, The C.mmp Multiprocessor System, The S-1 Multiprocessor, The HEP Multiprocessor, Mainframe Multiprocessor Systems, The Cray X-map and Cray 2

TEXT BOOKS:

1. Probability and Statistics with Reliability, Queuing, and Computer Science Applications, Kishore Trivedi, PHI.
2. Computer Architecture and Parallel Processing, Kai Hwang and Faye A. Briggs, MGH.

REFERENCE:

1. Computer Networks and Systems: Queuing Theory and Performance Evaluation, Thomas G. Robertazzi, Springer.

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COMPUTER SYSTEMS MAINTENANCE

UNIT –I

An Inside Look at a Contemporary PC, The Contemporary PC, Disassembly/ Reassembly Notes, Standardized Form Factors, An Inside Look at Operating Systems and the Boot Process, The PC Hierarchy, Understanding Popular OS Features, The Boot Process, Mastering MSDOS.SYS, Creating a Boot Diskette, Multi-Boot Setup

UNIT –II

BIOS Typical Motherboard BIOS, BIOS Features, BIOS and Boot Sequence, BIOS Shortcomings and Compatibility issues, BIOS Troubleshooting, BIOS Upgrades. Buses Industry Standard Architecture (ISA), Peripheral Component Interconnect (PCI), Accelerated Graphics Port (AGP), Communication and Networking Riser (CNR). CD Drives: The CD-ROM Drive, The CD-R Drive, The CD-RW Drive, Troubleshooting CD Drives.

UNIT –III

CPU Identification and Troubleshooting CPU Essentials, Modern CPU Concepts, The Intel CPUs, The AMD CPUs, The VIA Cyrix CPUs, CPU Over clocking, Troubleshooting CPU Problems.

UNIT –IV

Data Recovery Techniques: Understanding Data Loss, Protecting Drives and Data Recovering Files and Folders, Recovering FAT and Directory Damage Recovering the MBR, Data Recovery Tips, Data Recovery Troubleshooting Drive Adapters and RAID Basics, Understanding the IDE Family, Controller Installation, RAID Primer, Troubleshooting a Drive Adapter.

UNIT –V

DVD Drives The Potential of DVD, Specifications and Standards, Content Protection, DVD Media, The DVD Drive and Decoder, DVD Drive Installation and Replacement, Troubleshooting DVD Drives, Enhancing System Performance Checking System Performance, System Monitor and Performance, Graphics Performance, Memory Performance, Drive Performance, Managing the Registry More Windows Performance Tips

UNIT –VI

Floppy Drives: The Floppy Drive, Floppy Troubleshooting Hard Drives: Basic Drive Concepts, IDE Drive Standards and Features, Drive Construction, Drive Preparing Concepts, Drive Capacity Limits, Drive Installation/ Replacement Guidelines, Drive Testing and Troubleshooting.

UNIT -VII

Keyboards: Keyboard Basics, Keyboard Maintenance and Troubleshooting, Memory Troubleshooting, Essential Memory Concepts, Memory Packages and Structures, Logical Memory Organization, Memory Considerations, Parity and ECC, Selecting and Installing Memory, Memory Troubleshooting Modems: Dial-up Modem Construction and Operation, Understanding Signal Modulation, Signaling Standards, Installing an Analog Modem, Installing a Cable/ DSL Modem, Dial-up/Cable/DSL Modem Troubleshooting

UNIT –VIII

Power Protection: Understanding Power Problems, Protection Devices, Backup, Backup, Backup Troubleshooting Power Protection Devices, Power Supplies and Power Management, Understanding Switching Supplies, Upgrading a Power Supply, Troubleshooting Switching Power Supplies, Understanding Power Management, Troubleshooting Power Management

TEXT BOOKS

1. PC Troubleshooting & Repair, The ultimate Reference, Stephen J. Bigelow, Dreamtech.
2. A+ Guide to managing and maintaining Your PC, Comprehensive, Fifth Edition, THOMSON.

REFERENCE:

1. PC Hardware Annoyances, Stephen J. Bigelow, SPD-Oreille.

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**NETWORK MANAGEMENT SYSTEMS
(ELECTIVE-I)**

Unit - I :

Data communications and Network Management Overview: Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

UNIT-II:

SNMPv1 Network Management: Organization and Information and Information Models.
Managed network: Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

UNIT-III:

SNMPv1 Network Management: Communication and Functional Models The SNMP Communication Model, Functional model

UNIT-IV:

SNMP Management: SNMPv2 :Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1

UNIT-V:

SNMP Management: RMON:What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON

UNIT-VI:

Telecommunications Management Network:Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, Implementation Issues.

UNIT-VII:

Network Management Tools and Systems:Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

UNIT-VIII:

Web-Based Management:NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: , Future Directions

TEXT BOOK:

1. Network Management, Principles and Practice, Mani Subrahmanian, Pearson Education.

REFERENCES :

1. Network management, Morris, Pearson Education.
2. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
3. Distributed Network Management, Paul, John Wiley.

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**INFORMATION SECURITY
(ELECTIVE-I)**

UNIT-I:

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT-II:

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC,

UNIT-III:

Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service

UNIT-IV:

Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT-V:

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management

UNIT-VI:

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET)

UNIT-VII:

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3
Intruders, Viruses and related threats

UNIT-VIII:

Firewall Design principles, Trusted Systems. Intrusion Detection Systems

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W. Manzuik and Ryan Permeh, wiley Dreamtech,

REFERENCES:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.

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**HUMAN COMPUTER INTERFACE
(ELECTIVE-I)**

UNIT-I:

Introduction: Importance of user Interface – definition, importance of good design. Benefits of good design. A brief history of Screen design,

UNIT-II:

The graphical user interface – popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT-III:

Design process – Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT-IV:

Screen Designing:- Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT-V

Windows – New and Navigation schemes selection of window, selection of devices based and screen based controls.

UNIT-VI

Components – text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT-VII

Software tools – Specification methods, interface – Building Tools.

UNIT-VIII

Interaction Devices – Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

TEXT BOOKS:

1. The essential guide to user interface design, Wilbert O Galitz, Wiley DreamaTech.
2. Designing the user interface. 3rd Edition Ben Shneidermann , Pearson Education Asia

REFERENCES:

1. Human – Computer Interaction. ALAN DIX, JANET FINCAY, GRE GORYD, ABOWD, RUSSELL BEALG, PEARSON.
2. Interaction Design, PRECE, ROGERS, SHARPS. Wiley Dreamtech,
3. User Interface Design, Soren Lauesen , Pearson Education.

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**ADVANCED COMPUTING CONCEPTS
(ELECTIVE-II)**

UNIT I

Grid Computing: Data & Computational Grids, Grid Architectures and its relations to various Distributed Technologies

UNIT II

Autonomic Computing, Examples of the Grid Computing Efforts (IBM).

UNIT III

Cluster setup & its Advantages, Performance Models & Simulations; Networking Protocols & I/O, Messaging systems.

UNIT IV

Process scheduling, Load sharing and Balancing; Distributed shared memory, parallel I/O

UNIT V

Example cluster System - Beowlf; Cluster Operating systems: COMPaS and NanOS

UNIT VI

Pervasive Computing concepts & Scenarios; Hardware & Software; Human - machine interface.

UNIT VII

Device connectivity; Java for Pervasive devices; Application examples

UNIT V III

Classical Vs Quantum logic gates ;One ,two & three Qubit Quantum gates; Fredkin & Toffoli gates ; Quantum circuits; Quantum algorithms

TEXT BOOK:

1. J. Joseph & C. Fellenstein: 'Grid Computing', Pearson Education.
2. J.Burkhardt et .al : 'Pervasive computing' Pearson Education
3. Marivesar: 'Approaching quantum computing', Pearson Education.

REFERENCES:

1. Raj Kumar Buyya: 'High performance cluster computing', Pearson Education.
2. Neilsen & Chung L: 'Quantum computing and Quantum Information', Cambridge University Press.
3. A networking approach to Grid Computing, Minoli, Wiley.

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**DISTRIBUTED DATABASES
(ELECTIVE II)**

UNIT I

Features of Distributed versus Centralized Databases, Principles Of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types of Data Fragmentation, Integrity Constraints in Distributed Databases

UNIT –II

Translation of Global Queries to Fragment Queries, Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries

UNIT –III

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, General Queries

UNIT IV

The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions

UNIT V

Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT –VI

Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT -VII

Architectural Issues, Alternative Client/Server Architectures, Cache Consistency Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution , Transaction Management, Transaction Management in Object DBMSs , Transactions as Objects

UNIT -VIII

Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues Transaction Management Transaction and Computation Model Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation And Interoperability Object Management Architecture CORBA and Database Interoperability Distributed Component Model COM/OLE and Database Interoperability, PUSH-Based Technologies

TEXT BOOKS

1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill
2. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez - Pearson Education

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**NEURAL NETWORKS
(ELECTIVE-II)**

Objectives

Understanding the alternative paradigm of conventional computing by machines called neural computing. This subject covers from basic neuron model to complex models, their learning algorithms and their applications

UNIT I

INTRODUCTION - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks (p. no's 1 –49)

UNIT II

LEARNING PROCESS – Error Correction learning, Memory based learning, Hebbian learning, Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaption, Statistical nature of the learning process, (p. no's 50 –116)

UNIT III

SINGLE LAYER PERCEPTRONS – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron –convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment (p. no's 117 –155)

UNIT IV

MULTILAYER PERCEPTRON – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Computer experiment, feature detection, (p. no's 156 –201)

UNIT V

BACK PROPAGATION - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning. (p. no's 202 –234)

UNIT VI

SELF ORGANIZATION MAPS – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive pattern classification (p. no's 443 –469, 9.1 –9.8)

UNIT VII

NEURO DYNAMICS – Dynamical systems, stability of equilibrium states, attractors, neurodynamical models, manipulation of attractors as a recurrent network paradigm (p. no's 664 –680, 14.1 –14.6)

UNIT VIII

HOPFIELD MODELS – Hopfield models, computer experiment I (p. no's 680-701, 14.7 –14.8)

TEXT BOOK:

1. Neural networks A comprehensive foundations, Simon Haykin, Pearson Education 2nd edition 2004

REFERENCES

1. Artificial neural networks - B.Vegnanarayana Prentice Hall of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003
3. Neural networks James A Freeman David M S kapura pearson education

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EMBEDDED SYSTEMS LAB

1. Write a program to
 - a) Read inputs from switches
 - b) To make LEDs blink
 2. Write a Program for serial communication
 3. Write a program for encryption/decryption
 4. Develop necessary interfacing circuit to read data from a sensor and process using the 8051 board. The data has to be displayed on a PC monitor.
 5. Port RTOs (μ COS) on to 89CS1 board and Verify.
 6. Simulate on elevator movement using RTOs on 89CS1 board
- Ref: KVKKF Prasad: 'Embedded/Real-Time Systems', Dreamtech. Press.

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MULTIMEDIA AND APPLICATION DEVELOPMENT LAB

1. Assigning Actions to an Object, and a Button
 2. Creating Loops
 3. Generation Random Numbers
 4. Creating a Function, Calling a Function
 5. Detecting the Player Version
 6. Detecting the Operating System
 7. Checking the System language
 8. Detecting Display Settings
 9. Tinting a Movie Clip's Color
 10. Controlling a Movie Clip's Color with Sliders
 11. Drawing a Circle
 12. Drawing a Rectangle
 13. Filling a Shape with a Gradient
 14. Scripting Masks
 15. Converting Angle Measurements
 16. Calculating the Distance Between the Two Points
 17. Formatting Currency Amount
 18. Converting Between Units of Measurement
 19. Determining Points Along a Circle
 20. Sorting or Reversing an Array
 21. Implementing a Custom Sort
 22. Creating a Text Field
 23. Making a Password Inputfield
- All the above programs are to be done in Flash MX 2004.

REFERENCES:

1. Action Script Cookbook, Joey Lott, SPD-Oreilly.
2. Flash MX Action Script for designers, Doug Sahlin, Dreamtech Wiley.
3. Flash MX Professional 2004 Unleashed, David Voegelers and Matthew Pizzi, Pearson Education.