Unit I

Introduction: machine structure, machine language and assembly language. elements of assembly language programming, need for assemblers, design of assemblers: one pass and two pass assembler, symbol table organization, table processing, searching and sorting.

Unit II

Macro Processors: Macro instructions, features of macro facility, design of macro processor: design of one and two pass macro processor and their relationship with an assembler.

Unit III

Linkers: relocation and linking concepts, design of linker, self-relocating programmes. Loaders: Loading schemes: compile and go loaders, General loading Scheme: absolute loaders, subroutine linkages, relocating loaders, direct linking loaders. other loader schemes: binders, linking overlays, dynamic binders, design of absolute loader, design of direct linking loader.

Unit IV

Compiler Design: structure of a compiler, finite automaton and lexical analysis: role of lexical analyzer, regular expressions, finite automation, LEX. Syntax analysis: Role of parser, context free grammar. Basic parsing techniques: bottom up parsing, top down parsing, operator precedence parsing, LR parsers.

Unit V

Syntax directed translation schemes, intermediate code generation, intermediate languages, code optimization, loop optimization, code generation, machine model of code generator, error detection and recovery.

Text Books:

2. Compiler Principles, techniques and tools by Alfred V. Aho, Ram Sethi (Pearson Education)

Reference Books:

2. Compiler Design by A S Ullman.
Unit I
Input/output devices, refresh CRT, raster and random scan displays, DVST, Line DDA Algorithm, Bresenham's line algorithm, Midpoint and Bresenham's Circle Generating algorithm, Ellipse, Scan-line polygon fill, inside/outside test, Boundary - fill, flood fill algorithm, character Generation.

Unit II
Attribute of output primitives: line attributes, color and Gray Scale levels, CMY, RGB color model, Character attributes, 2-D viewing, Cohen-Sutherland, Midpoint subdivision, Cyrus beck and Liang-Barisky line clipping algorithm, Character clipping.

Unit III
Transformation in 2D and 3D: translation, rotation, scaling, shearing, reflection, Homogeneous Coordinate System.

Unit IV
Parallel and perspective projections, Ortho graphics cabinet, cavalier and axonometric projections, methods of general parallel and one point perspective projections, clipping list priority hidden line elimination algorithm, Z-buffer and floating horizon algorithm.

Unit V
Hermite cubic curves and surfaces, Beizer and B-spline curves and surfaces, rational curves and surfaces of revolutions, cylindrical, ruled and Sweep surfaces.

Text Book:

Reference Books:
2. Computer graphics by Hill, Mac Millan publishing.
4. Geometric modeling by Mortenson, John Wililay publishing.
Unit I

Characteristics of Neural Networks. biological neuron, action potentials, neuron firing, artificial neural networks. HLU, multilayer neural networks models of neuron, topologies, basic learning laws.

Unit II

Activation dynamics models: additive and shunting, bivalent additive BAM, functional units of ANN for pattern recognition Task.

Unit III

Analysis of Pattern Association, classification and mapping networks, training the threshold as weight in perceptron rule and delta rule, LMS and Back propagation algorithm.

Unit IV

Analysis of pattern storage networks: Hopfield Model: capacity and energy analysis, state transition diagram. Competitive learning Neural Networks: introduction, components. analysis of feedback layer for different output functions.

Unit V

Fuzziness as multivalence, subsethood, fuzzy systems: as structured numerical estimators, as parallel associators. fuzzy entropy theorem, subsethood theorem, fuzzy Hebb's LAM. fuzzy truck backer upper control systems.

Text Books:

1. Artificial Neural Networks by B. Yagnarayana.
2. Neural Networks and Fuzzy systems by Bart Kosko, PHI.
MCS 403 (2)  PARALLEL PROCESSING

Unit I
   Introduction to parallel processing: parallel processing mechanism, parallelism in unprocessed system, parallel computer structure, architecture classification scheme.

Unit II
   Pipelining and vector processing: Instruction and arithmetic pipelines, vector processing requirements, pipeline computers and vectorization methods. Various vector processors: STAR -100, CRA Y-1, CYBER-205, FUJITSU-200, and their special features.

Unit III
   SIMD Array processor: parallel algorithm for array processors, SIMD computers and performance enhancement.

Unit IV
   Multiprocessor architecture and programming: functional structures, interconnection networks, parallel memory organizations, multiprocessor control algorithms.

Unit V
   Interprocess communication mechanisms, system deadlocks and protection, multiprocessor scheduling strategies. Parallel algorithms for multiprocessor-synchronous & asynchronous. Data flow computers: data-driven computing and languages, advantage and potential difficulties etc.

Text Book:


Reference Books:

2. Parallel Processing System by Evans D.J., Cambridge Univ. 1982
3. The Architecture of Pipelined computer by Koghi H.
5. Parallel Computers Architecture Programming & Algorithm by Hockney R. W. & Jesshope C.R.
Unit I
Digital Image Fundamentals: an image model, sampling and quantization, some basic relationships between pixels, imaging geometry, image transforms: introduction to the Fourier transform, Discrete Fourier transform, some properties of the two-dimensional Fourier transform, convolution and correlation, sampling, Fast Fourier transform, FFT algorithm, inverse FFT, other separable image transforms, Walsh transform, Hadamard transform, discrete cosine transform, Hotelling transform, application to image rotation, Hough transform.

Unit II
Image Enhancement, background, spatial-domain methods, frequency domain methods, image enhancement by histogram-modification techniques, foundation, histogram equalization, local enhancement, image smoothing, neighborhood averaging of multiple images, image sharpening, sharpening by differentiation, highpass filtering, ideal filter, Butterworth filter, enhancement based on an image model, generation of spatial masks from frequency domain specifications.

Unit III

Unit IV
Image Encoding: fidelity criteria, objective and subjective fidelity criteria, encoding process, the mapping, the quantizer, the coder, entropy, Huffman code, b-codes, image encoding relative to a fidelity criterion.

Unit V
Image Segmentation: detection of discontinuities, point and line detection, edge detection, gradient operator, Laplacian operator, combined detection, edge linking and boundary detection, local analysis, global analysis via the Hough transform, global analysis via graph-theoretic techniques, thresholding: foundation, role of illumination, a global thresholding technique, optimal thresholding region-oriented segmentation, basic formulation.

Text Book:
1. Image Processing by Gonzalez and Wintz.
Unit I

The Internet's brief history, getting connected to the internet, installing the essential internet clients, internet addresses, domain name system, internet governance, internet hosts, LAN internet access, PPP/SLIP internet access, TCP/IP and other protocols on the internet.

Unit II

Features of the Internet, services provided by the internet, e-mail system, usenet newsgroups, ftp, chatting and conferencing, world wide web: e-commerce, internet and extranet, internet security (firewalls, cryptography, protection from viruses), security of web browsers, impact of the internet on social life.

Unit III


Unit IV

Virtual networks, value-added networks, private networks, creating a web site, creating web pages with HTML, creating web pages with Front Page Express.

Unit V

Electronic publishing: advantages, disadvantages, copyright issues, credit issues, project gutenberg and online books, electronic journals, magazines and newspapers, web programming material: the java script programming language, applets, guest books, web page, counters programming languages, applets, guest book, web page counters.

Text Books:

1. Using the Internet by Honeycutt (Prentice Hall of India).
Unit I

Unit II
Distributed operating system, resource sharing, network operating system command languages, agent process, memory management schemes, case study of system like mach, locos accent, file servers, operating system for parallel computing.

Unit III
Distributed Data Base. Introduction to data base structure, relation building database storage. Case study of distributed queries and updates in DDBS. failures line SDDR, ORACLE, INGRES.

Unit IV
Distributed Software: introduction of parallel programming languages, parallel C, OCCAM, concurrent pascal, system programming with C.

Unit V
Parallel language and Algorithm design for the array processor: Actus, other Non-von-neumann type languages: CSP, distributed process (DP), Ada, SR, Linda.

Text Book:
1. Distributed systems: Concepts and Design by Coulouril, Addison Wesley.

Reference Book:
1. An Introduction to Distributed and Parallel Computing by Joel M. Crichlow PHI Publication.
Unit I
The structure of Windows programming code and Resources, program instances, hungarian notation, a minimal window program structure, the windows: file creating a new window class, message loop.

Unit II
Menus, mouse handling, text and graphics output, types of windows controls (static buttons, option & check buttons, list and combo boxes, scroll bar, edit control), child and pop-up windows, dialog boxes, exchanging data with dialog boxes modeless and system modal dialog box.

Unit III
Memory management in windows using fixed and discard able memory blocks, global memory allocation, file management bitmaps and DLL.

Unit IV
C++ Basics: constants, keywords, variables and data types, control statements, pointers, objects & classes.

Unit V
The VC++ Environment MFC programming with VC++, scrolling, strong data in a file, toolbars & selection, the MFC source code files.

Text Books:
2. Windows 2000-programming form ground up by Heberl Shield.
3. Windows API primer plus by Jim Conger.
4. Learn VC++ 6.0 Now by Chuck sphar (prentice-Hall India).
5. Professional MFC With Visual C++5 by Mike Blaszczak (work press).
Unit I

Introduction to data mining, data mining - on what kind of data?, data mining functionalities, classification of data mining system, Data Warehousing: introduction to data warehousing, Multidimensional data model: data cubes, star, snow, flake and fact - constellation schemes, measures, concept hierarchies, OLAP operations in Multidimensional Data model, Data warehouse Architecture, Data warehouse implementation.

Unit II

Data pre-processing & DMQL: Data clearing, data integration and transformation, data reduction, discretization and concept hierarchy generation, data mining primitives, DMQL.

Unit III

Concept description: Introduction to concept description, data generalization, mining class compressions, mining descriptive statistical measures in large data bases.

Unit IV

Association mining: Association rule mining, mining single dimensional association rules from transactional data bases, apriori, improving the efficiency of apriori, FP growth, mining multilevel association rules, mining multidimensional association rules, from association mining to co-relation analysis, constraint based association mining.

Unit V

Classification and prediction: Introduction to classification, issues, classification by decision tree introduction, Bayesian classification, classification by back propagation, introduction to cluster analysis: types of data in cluster analysis, categorization of major clustering methods, partitioning methods, hierarchical methods, outlier analysis.

Text Book:

1. Data Mining Concepts and Techniques by Han and Kamber (Elsevier Publication).

Reference Books:

1. Data warehousing in the real world by Sam Arabory and Dennis Murray.
2. Data mining by Petter Adriaans and Dolfzantinge. Addition Welsey.
3. Data warehousing fundamentals by Paulraj Porria Wse Wiley publication.
BIO-INFORMATICS

Unit I

Bioinformatics – an overview: Introduction, objectives of bioinformatics, kind of data used, information molecules, basic structures of nucleic acids, DNA, RNA, DNA sequencing and polymerase chain reaction (PCR), proteins structure, functions, protein folding and characterization.

Unit II

Biological databases: Introduction, types of databases, nucleotide and protein sequence databases, major bioinformatics databases, introduction to biostatistics, data integration, data analysis. Operating system (Linux, UNIX), HTML, XML, CML, BSML etc.

Unit III

Sequence analysis: Models for sequence analysis, methods for alignment (dot matrices), methods for optimal alignment (gap penalties and scoring matrices), tools for sequence alignment – Fasta, BLAST, PSI-blast, Multiple Sequence Alignment (MSA) – tools and applications.

Unit IV

Phylogenetic analysis: Phylogenetic trees, distance matrix (MD) and character based methods, methods of phylogenetic evaluation, gene prediction methods, gene prediction tools, gene mapping, DNA sequencing, algorithms for alignment of sequencing fragments, DNA micro arrays.

Unit V

Proteomics: Proteome analysis, tools for proteome analysis, different structural proteins, protein classification, methods of structure prediction (known folds and unknown folds), protein function prediction, metabolic pathways, gene networks their properties and analysis.

Text Books:

1. Introduction to Bioinformatics by Attwood.
2. Bioinformatics – Sequence and Genome analysis by David W. Mount.
4. Recent advances in Bioinformatics by Irían K. Khan.