

COMMUNICATION SKILLS - I

Marks:50

Lectures: 40

Subject code : ICT1-1 T

Unit I: Language and communication

Definition of Language, nature of language

Characteristics of Human Language

Varieties of English Language: British, American, Indian, Australian etc.

English for specific and special purposes.

Communication:

Importance of communication;

Animal and human communication;

Methods of communication (Verbal & Non-Verbal);

Barriers of communication.

Unit II: Oral Communication

Basic skills of communication

Listening to and Understanding

a) Extended natural speech in business situations

Both face to face and on the telephone.

b) Understanding standard American, British and Indian accents.

Speaking with correct Pronunciation

a) English Consonants

b) English Vowels

Speaking with right accent

Unit III: Presentation Skills

1) Planning and preparing to speak

2) Strategies for making powerful openings in presentations.

3) Body Language

4) Voice Modulations

Unit IV: a) Meetings

b) Group discussions

c) Seminars

d) Conference

e) Interviews

Reference books

- 1) DEVELOPING COMMUNICATION SKILLS Krishna Mohan and Meera Bajaj
- 2) THE STERILING BOOK OF COMMON ERRORS IN ENGLISH Gratian Vass
- 3) SPOKEN ENGLISH FOR YOU.R.Radha Krishna Pillai and K Rajeevan
- 4) INDIAN AND BRITISH ENGLISH- A HAND BOOK OF USAGE AND PRONUNCIATION. Paroo Nihlani, Ray Tongue and Priya Hosali
- 5) A COURSE IN PHONETICS AND SPOKEN ENGLISH Sethi and Dhamija.
- 6) ENGLISH PRONUNCIATION DICTIONARY. Daniel Jones.
- 7) MACMILLAN'S FOUNDATION ENGLISH.R. K. Dwivedi and A. Kumar

FUNDAMENTALS OF DISCRETE MATHEMATICS

(50Marks)

(40 Lectures)

Subject code: ICT1-2 T

1) SET THEORY

- i) Set notations and descriptions
- ii) Sub Sets
- iii) Venn Diagram
- iv) Set Operations

2) RELATIONS & FUNCTIONS

- i) Basic Definition
- ii) Relations
- iii) Cartesian Product
- iv) Functions, Domain, Range.
- v) Types of Functions: One-One, On-To, In-To, One to One.

3) FUNCTIONS OF TWO & THREE VARIABLES

- i) Introduction to Limit, Continuity, Derivatives, chain rule (without proof)

4) LOGIC

- i) Propositions, Logical connectives, truth tables, propositional form.
- ii) Logical equivalence. Tautology and contradiction.
- iii) Predicates
- iv) Valid arguments

5) GRAPHS

- i) Definition and elementary results
- ii) Types of graphs
- iii) Isomorphism

6) CONNECTED GRAPHS

- i) Definition of connected, disconnected graphs.
- ii) Edge sequence, path, circuit, definitions, and elementary results
- iii) Vertex and edge connectivity
- iv) Introduction to directed Graphs
- v) Degree sequence and Havel- Hakimi theorem (Without proof)

7) TREE

- i) Definition and equivalent characterizations, elementary results
- ii) Center of a tree.
- iii) Spanning trees and fundamental circuits and cut sets
- iv) Binary trees and elementary results.

Reference books:

1. Elements of discrete Mathematics by C.L. Liu.
2. Discrete Mathematics by Olympia Nicodemi,
3. Discrete Mathematical Structures for Computer Science by Alon Doerr and K. Levasieur.
4. A first step in graph Theory by Raghunathan, Nimkar & Solapurkar.

FUNDAMENTALS OF COMPUTERS

Marks: 50

Lectures: 40

Subject code: ICT1-3 T

1. Computer System Characteristics And Capability:

Basic structure, ALU, memory, CPU, I/O devices, Development of computers. Classification of computers:(Micro, mini frame, super computer, pc,server, workstations)

2. Data Representation With in Computer:

BIT, BYTE, WORD,ASCII, EBCDIC, BCD Code, Introduction to Number system: Binary, Octal, Decimal and Hexadecimal. Conversation from one number system to another number system. Introduction to Basic Gates.

3. Input Devices:

Keyboard,Direct Entry: Card readers, scanning devices (BAR CODE, OMR, MICR), Voice input devices, Light pen, Mouse, Touch Screen, Digitizer, Scanner.

4. Output Devices:

Printers: Impact and Non-impact printers.CRT, LCD, CD-WRITTER, ZIP DRIVE, DVD, Introduction to Web Camera, modem

5. Memory:

RAM, ROM, PROM, EPROM, EEPROM,Base memory, extended memory, expanded memory, Cache memory,Storage devices Tape, FDD, HDD, CDROM, Pen Drive.

6. Algorithm & Flowcharts:

Definition and properties
Principles of flowcharting
Flowcharting symbols
Converting algorithms to flowcharts.

7. Introduction To Programming Environment

History of languages, high-level, Low level, Assembly languages etc.
Compilers, Interpreters, Assemblers, Linkers, Loaders.

8. Microcomputers

What is Microprocessor, Introduction to Family of microprocessor, Ideal microcomputer, An Actual microcomputer, Memory system for microcomputer, Minimum microcomputer configuration.

9. Voice and Data communication

Types of communications, Physical communication, Public Switched Telephone Network, Cellular communication system.

Reference Books:

1. FUNDAMENTALS OF COMPUTERS BY V. RAJARAMAN.
2. COMPUTERS AND COMMONSENSE BY R. HUNT AND SHELL Y.
3. FUNDAMENTALS OF COMPUTER Systems. Low Price Edition.
4. Microprocessor B.Ram.

PROGRAMMING IN 'C'

Marks:50

Lecturers – 40

Subject code: ICT1-4 T

1. Introduction To C:

- 1.1 The character Set, Constants, Variables and Keywords, Types of constants, Types of variables, keywords, data types.
- 1.2 Instructions: Type Declaration Instruction, Arithmetic Instruction

2. Data Input and Output:

- 2.1 Getchar (), putchar (), printf (), scanf (), puts (), gets (),

3. The Decision Control Structure:

- 3.1 The if Statement
- 3.2 The if-else Statement
- 3.3 Use of logical operators

4. The Loop Control Structure:

- 4.1 The while loop, the for Loop
- 4.2 The break, continue, go to statement
- 4.3 The case control structure: Decisions using switch

5. Arrays:

- 5.1 What are Arrays? Arrays Initialization, Bounds Checking
- 5.2 Types of Array
- 5.3 Initializing a 2- Dimensional & Multidimensional Arrays

6. Storage Classes:

- 6.1 Automatic, Register, Static, External (Local and Global), Scope rules

7. Functions:

- 7.1 Arguments and local variables, Returning Function results, Default return type and Type void, passing values between functions, Declaration of function type.
- 7.2 Function with variable arguments, Recursion

8. Character Strings:

- 8.1 What are Strings? Standard library String Functions: strlen (), strcpy (), strcat (), strcmp().

9. Pointers:

- 9.1 Introduction to Pointers
- 9.2 Operations on Pointers
- 9.3 Pointers and Functions
- 9.4 Pointers and Arrays.

Reference Books:

1. LET US C BY YASHWANT KANETKAR – BPB PUBLICATIONS
2. PROGRAMMING IN ANSI C BY E. BALGURUSAMY – TMH
3. TURBO C/C++: THE COMPLETE REFERENCE BY H. SCHILDIT
4. PROGRAMMING WITH “BY BYRON GOVTFRED SCEOND EDITION TMH.

LAB I

Subject code: ICT1-5 P

Section A: A Case Study on Communication Skill.

Section B : 20 Programs on Control Structure, Structure and union, Function

LAB I

Subject code: ICT1-6 P

Section A: A Case Study on Fundamental of Computer.

Section B : 20 problems or programs on discrete mathematics by using C or any compatible tool

COMMUNICATION SKILLS - II

Marks 50

Lectures: 40

Subject Code ICT 2-1

Unit I: **Reading**

- a) Reading and understanding business letters, Reports and memos.
- b) Reading and understanding scientific texts.
- c) Reading a dictionary, thesaurus, and encyclopedia.
- d) Reading passages and poems.

Unit II: **Writing**

- a) Letters- Formal and Informal
- b) Note taking and note making
- c) Reports
- d) Curriculum Vitae
- e) Making advertisements for newspapers
- f) Rearranging the jumbled sentences.

Unit III: **Use of Grammar and usage reference sources.**

- a) Morphology: Word formation processes
- b) Word classes
- c) Phrase, Clause and Sentence
- d) Punctuation and Capitalization.
- e) Common errors in the use of English.

Unit IV: **Situational and functional English**

Suggested Reading:

1. PRACTICAL ENGLISH GRAMMAR
Thomson and Martinet
2. LIVING ENGLISH STRUCTURE
W. S. Allen
3. UNIVERSITY ENGLISH GRAMMAR
Quirk et al
4. MODERN ENGLISH GRAMMAR (AN INTRODUCTION)
L. S. Deshpande & P.H. Dharamsi
5. ENGLISH FOR PRACTICAL PURPOSES
Z.N.Patil, B.S.Walke, A.thorat, Z.Merchant
6. BUSINESS COMMUNICATION
Urmila Rai & S.M. Rai

STATISTICAL METHODS

Marks:50

Lecturers-40

Subject Code ICT 2-2

1. INTRODUCTION:

- 1.1 Definition: Webster's and Sacristy's definitions of statistics.
Importance of statistics. History: Advantages and limitations.
Scope of statistics: industry. Economy, Computer Science, Social Science etc.,
Collection of Data.

2. DATA CONDENSATION AND GRAPHICAL METHODS:

- 2.1 Raw data, Attributes and Variables, Discrete and Continuous variables.
- 2.2 Construction of frequency distribution and cumulative frequency.
- 2.3 Graphical representation of frequency distribution: Histogram, frequency polygon
- 2.4 Diagrammatic representation: Simple bar, Subdivided bar, pie diagram.

3. MEASURES OF CENTRAL TENDENCY:

- 3.1. Concept of central tendency.
- 3.2. Arithmetic mean: Definition for ungrouped and grouped data, merits and demerits.
- 3.3 Median: Definition formula and computation for ungrouped and grouped data, merits and demerits.
- 3.4 Mode: Definition, formula and computing for ungrouped and grouped data merits and demerits.

4. MEASURES OF DISPERSION:

- 4.1 Concept of dispersion and measures of dispersion.
- 4.2 Range: definition for ungrouped and grouped data.
- 4.3 Standard deviation: Definition for ungrouped and grouped data, Mean Deviation.
- 4.4 Variance: Definition for grouped and ungrouped data,
- 4.5 Numerical problems.

5. PROBABILITY:

- 5.1 Permutation of n dissimilar objects taken r at time (without repetitions)
- 5.2 Combination of r objects taken from n objects.
- 5.3 Sample space (finite, countably infinite).
- 5.4 Events: types of events.
- 5.5 Probability: Classical definition.
- 5.6 Axioms of Probability.
- 5.7 Theorems on Probability
 - i) $0 \leq P(A) \leq 1$
 - ii) $P(A) + P(\bar{A}) = 1$

6. Correlations and Regression

6.1 Definition of correlation and regression, Karl Pearson's formula for ungrouped data of Correlation.

7. Analysis of Time series:

7.1 Component of time series, measure of trends, moving average and least square.

REFERENE BOOKS:

1. Fundamentals of Statistics by Goor, Gupta, Das Gupta.
2. Statistical Methods by S.P. Gupta
3. Business Statistics by S. Shaha
4. Modern Elementary Statistics by J.E. Freund
5. Fundamental of statistics by S.C. Gupta.
6. Fundamentals of applied statistics b Gupta and Kapoor

Digital Electronics

50 marks

Lectures : 40

Subject Code ICT 2-3

UNIT – I

Number Systems – Conversion from one number system to another – Complements

UNIT – II

Logic Gates : Basic Gates, Derived Gates, NAND gate as universal building block
Boolean Algebra – Axioms – Theorems – Simplification of Boolean functions – Map Method (upto 5 variables) – MC Clausky tabulation method.

UNIT – III

Sequential logic – RS, JK, D and T Flip-flops
Registers – Shift Registers, Buffer registers, Controlled Shift Registers, Controlled Buffer registers
Counters – Ripple counters – Synchronous counters – Design of counters.

UNIT – IV

Adders – Subtractors – Decoders – Encoders – Multiplexer – Demultiplexer –
Design of circuits using decoders/Multiplexers – ROM – PLA – Designing circuits using ROM/PLA.

UNIT – V

Design of ALU – Design of status registers – Design of Accumulator – Introduction to Computer design.

Books for Study

1. M.M.Mano – Digital logic and Computer Design – PHI- 1994.
2. T.C.Bartee – Computer Architecture and Logic Design 0 McGraw Hill – 1991

Objective: To introduce 8085 assembly language and thereby familiarize the student with architecture of microprocessors.

1. Microprocessor, Microcomputers and Assembly language

- Microprocessors
- Microprocessor Instruction set and computer languages
- From large Computers to Single chip micro controllers

2. Building Concept of Microprocessor

- Introduction , Study of human body
- Memory, input, output devices
- Central processing unit

3. 8085 Microprocessor

- Features of intel 8085 microprocessor
- Pin diagram and pin functions of 8085
- 8085 CPU architecture
- Functions internal blocks

4. Introduction to 8085 Assembly Language Programming

- The 8085 programming model
- Instruction Classification
- Instruction and Data formats
- How to write assembly and execute simple programs

5. 8085 Instruction Set-I

- Addressing Modes
- Classification of Instruction set
- Data Transfer group of Instructions
- Program examples for data transfer group

6. 8085 Instruction Set-II

- Arithmetic instructions group
- Program examples
- Logical instruction group
- Program examples

7. 8085 Instruction Set-III

- Conditional and unconditional Jump
- Conditional and unconditional CALL
- Conditional and unconditional RET

Reference books:

1. Microprocessors : Architecture, programming and Applications with 8085–By R.S.Gaonkar.
2. 8- bit Microprocessors – By V.J.Vibhute, P.B.borole
3. Microprocessor by B.Ram

LAB III**Subject code: ICT2-5 P**

Section A: A Case Study on Communication Skill II.

Section B : 15 Programs of 8085 microprocessor based on all types of instruction

LAB IV**Subject code: ICT2-6 P**

Section A: A Case Study on Digital Electronics.

Section B : 15 problems or programs on statistical methods by using C or any compatible tool

Web Technology

50Marks

Total Lectures:40

Subject Code ICT 3-1

1. Web Publishing 5 Hrs

- 1.1 Basic HTML Concepts
- 1.2 HTML: Structured Language
- 1.3 Overview of HTML
- 1.4 Web Browser
- 1.5 WWW
- 1.6 Web Server
- 1.7 The Phases of web site development
- 1.7.1 Implementation, Maintenance, Testing
- 1.8 What are Links or URLs

2. The Markup Tags 8 Hrs

- 2.1 HTML
- 2.2 HEAD
- 2.3 TITLE
- 2.3 BODY
- 2.4 Paragraphs
- 2.5 Lists
- 2.6 Formatted and Unformatted Text
- 2.7 Extended Quotations
- 2.8 Address
- 2.9 Horizontal Rules
- 2.10 Hyperlink
- 2.11 Font (Size, Color)
- 2.12 Image (Add, Alignments)
- 2.13 Table
- 2.14 Cell Spacing / Cell Padding
- 2.15 Frame Set
- 2.16 Form

4. Designing Web Pages

- 4.1 Working with text
- 4.2 Inserting Images
 - 4.2.1 Web Graphic Format GIF, JPEG, PNG
 - 4.2.2 Inline Images
 - 4.2.3 Background images, Horizontal Rules
 - 4.2.4 Banner Ads
 - 4.2.5 Rollover Images
- 4.3 Establishing Web Links
 - 4.3.1 Understanding URLs
 - 4.3.2 Adding an E-Mail Link
 - 4.3.3 Navigating with Anchors

4.4 Working with Divs and Layers

4.4.1 Placing <div> tags

4.4.2 Creating Layers

4.4.3 Modifying a Layer

4.5 Creating Lists

4.5.1 Unordered Lists

4.5.2 Ordered Lists

4.5.3 Definition Lists

4.5.4 Nested Lists

5. Setting up Tables

5.1 HTML Table Fundamentals

5.2 Inserting Tables in Dreamweaver

5.3 Modifying Tables

5.4 Working with Table formats

6. Interactive Forms

6.1 How HTML forms work

6.2 Inserting a form in Dreamweaver

6.3 Using Text fields

6.4 Providing Checkboxes and Radio Buttons

6.5 Creating form lists and Menus

6.6 Activating forms with buttons

6.7 Using Hidden fields and File fields

7. Adding Multimedia Element

7.1 Using Audio on Web Page

7.1.1 Digital Audio File formats

7.1.2 MIDI files

7.1.3 Linking to Audio File

7.1.4 Embedding Sounds and Music

7.2 Adding Video to Web Page

7.2.1 Video on the Web

7.2.2 The Streaming Media

7.2.3 RealMedia

7.2.4 QuickTime

7.2.5 Windows Media

7.2.6 Playing Videos

Reference Books

1. WEB PUBLISHING BY MONICA D' SOUZA & JUDE D' SOUZA

2. COMPLETE REFERENCE - HTML - TOWELL

1. Structure & Union

Structure: Introduction, Declaration and initializing structure, Accessing structure members, Nested structures, Arrays of structure, typedef statement.

Unions: Declaration, Difference between structure and union

2. Pointers:

Introduction, Memory organization. Declaration and initialization of pointers. The pointer operator * and &, De-referencing, Pointer expression and pointer arithmetic, Pointer to an array, Pointer to pointer, Constant pointers.

3. Functions & Pointers:

Call by reference, Passing array and structure to function, functions returning pointers, character pointer, Two dimensional array of string, array of pointer to string, passing structure pointer to function, arrow (->) operator.

4. Storage Class & Library Functions:

Storage classes, Scope, visibility and lifetime of variable, block and file scope, auto, extern, static and register storage classes.

String handling functions: strcpy(), strcmp(), strcat(), strlen(),strupr(),strlwr(), gets(), puts() Data conversion functions from stdlib.h: atoi(), atol(), atof(), itoa(), ltoa(), random(), calloc(), malloc(), exit(), abs(), toupper(), tolower()

5. Preprocessor Directives:

File inclusion and conditional compiler directives, Macro substitution, #define, #if, #ifdef, #else, #elif, #endif,

6. File Handling :

File handling: Introduction, Opening & closing a file, Input/Output operations on files, text and binary files, getc(), putc() function. File copy program, fprintf() and fscanf(). fread() and fwrite() function. Writing and reading records from binary file, Appending, modifying and deleting a record from file, Random access functions fseek(), rewind(), flushall(), remove(), rename(). Command line arguments: use of argc and argv.

8. Graphics in C:

Introduction: initgraph() and detectgraph() function, Drawing object in C, Line, Circle, Rectangle, Ellipse, Changing foreground & background colors, Filling object by color, outtextx() function.

Reference books:

1. Let us C Solutions : Y.P. Kanetkar [bpb publication]
2. Programming in C : E. Balagurusamy. [Tata macgraw hill]
3. Programming in C : Goterfried [Shaums Series]
4. Graphics Under C : Y. Kanetkar

Additional References:

1. Spirit of "C" : Moolish Kooper.
2. Test your Skills in C : Y.Kanetkar

OPERATING SYSTEMS

MARKS 50

LECTURES – 40

Subject Code ICT 3-3

1. Introduction to Operating System:

- 1.1 Definition of Operating System
- 1.2 Functions of Operating System
- 1.3 Multi-user, Multiprocessing
- 1.4 Multiprogramming: Time Sharing Systems, Real Time Systems
- 1.5 Hierarchical of Operating System

2. Memory Management:

- 2.1 Single Contiguous
- 2.2 Partition Allocation
- 2.3 Relocatable Partitioned
- 2.4 Page Memory Management
- 2.5 Introduction to Demand Paged & segmented Memory Management

3. Process Management:

- 3.1 What is process
- 3.2 Context Switching
- 3.3 Process Control Block
- 3.4 Job Scheduling & process scheduling
- 3.5 Process Synchronization
- 3.6 Race Condition
- 3.7 Introduction to Deadlocks

4. Device Management:

- 4.1 Techniques of Device Management
- 4.2 Dedicated, Shared, Virtual Devices
- 4.3 Device Characteristics
- 4.4 Channels & Control Units
- 4.5 I/O traffic Controller.

5. File Systems

- 5.1 A Simple file systems
- 5.2 General Model of file system
- 5.3 Symbolic file system

6. Parallel Processing

- 6.1 Introduction, What is Parallel Processing
- 6.2 Difference between distributed & Parallel processing
- 6.3 Advantages of parallel processing

Reference Books:

1. OPERATING SYSTEM BY STUART .E. MADNICK & JOHN. J. DONOVON
2. OPERATING SYSTEM BY MILAN MILENKOVIC (IBM CORPORATION)
3. OPERATING SYSTEM BY ACHYUTS GODBOLE
4. OPERATING SYSTEM BY H.M. DEITEL

Object Oriented Programming using C++

Marks : 50

lectures : 40

Subject Code ICT 3-4

Unit-I

An overview of object oriented programming, Drawbacks of procedural programming, Concepts of OOP: Class, Object, Data abstraction, Encapsulation, Inheritance, Polymorphism, Dynamic Binding, Message Passing.

Data types, Operators, I/O Statements.

Decision Making Statements : if, if-else statement, nested if-else, else if ladder, switch-case statement. Conditional statement.

Loops: The while loop, do-while loop, the for loop, for loop variations

Unit-II

Functions: Function declaration and definition,, Calling the Function, comparison with library functions, passing arguments to functions: passing variables, passing by value, passing structure variables, Returning values from functions, returning structure variables, reference arguments

Unit-III

Objects and classes: Classes and objects, specifying the class, C++ object as data types, Constructors and destructors, objects as functions arguments, overloaded constructors, return objects from functions, objects and memory, static class data, array of objects. Friend Functions.

Unit-IV

Inheritance: Derived Class and Base Class, specifying the derived class, accessing base class members, the protected access specifier, derived class constructors, overriding member functions, class hierarchies, “abstract” base class, constructors and member functions, multilevel, multiple inheritance, member functions in multiple inheritance, ambiguity and multiple inheritance. Virtual base class,

Polymorphism: Function overloading , Virtual functions & dynamic binding, Operator overloading: Overloading unary operators, the operator keyword, operator return values, overloading binary operators, concatenating strings, multiple overloading, comparison operators, arithmetic assignment operators.

Unit-V

Files and Streams: Streams, the stream class hierarchy, stream classes, header files, string I/O, writing strings, reading strings, detecting end-of-file, character I/O, object I/O writing an object to disk, binary versus character files, reading an object from disk, the stream class, the open function, file pointers, specifying the position, specifying the offset the tellg function, closing files, redirection, IOS flags, redirecting input and output, command-line arguments, overloading the extraction and insertion operators.

References:

1. Object Oriented Programming In C + + Robert Lafore, Galgotia
2. Introduction to C++, E Balguruswami
3. C + + Printer Plus, Stephen Parata, Galgotia

Other Reference Books:

1. An Introduction To The OOP :K.V. Witt, Galgotia
2. Jamsa’s 1001 C/C + + Tips, Kris Jamsa, Galgotia

LAB V**Subject code: ICT3-5 P**

Section A: A Case Study on Web Technology.

Section B : 20 Programs of Advance C programming.

LAB VI**Subject code: ICT3-6 P**

Section A: A Case Study on Operating system.

Section B : 20 programs on C++ programming.

1. Introduction to Policies, Standards & Guideline

Different types of policy standards and guidelines
Common elements
Policy standards and guide development
Policy creation

2. Services mechanism and attacks

2.1 Introduction to services mechanism and attacks
2.2 OSI security architecture
2.2.1 Security services
2.2.2 Security mechanism
2.2.3 Security attacks
2.2.4 A model for network security

3. Classical encryption techniques

3.1 Symmetric Cipher model
3.1.1 Cryptography
3.1.2 Crypto analysis
3.2 Substitution Techniques
3.2.1 Caesar Cipher
3.2.2 Monoalphabetic Cipher
3.2.3 Play air Cipher
3.2.4 Hill Cipher
3.2.5 Polyalphabetic Cipher
3.3 Transposition Techniques
3.4 Steganography

4. Intruders

4.1 Intruders
4.2 Intrusion Techniques
4.3 Password Management

5. Malicious Software 08Hrs

5.1 Viruses & related threats
5.2 Viruses countermeasures

6. Firewalls

6.1 Firewall design Principal
6.2 Trusted System

Reference Books

1. Cryptography & Network Security – William Stallings
2. Security Architecture & Design Deployment Operation –Cistopher M.King

1. Electronic Commerce

Electronic Commerce
Electronic Data Interchange
Benefits of EDI Value Added Networks
Electronic Commerce over the Internet.

2. The Internet

The Internet
The Internet Engineering Task Force IETF
The Internet Architecture Board
Internet communication Protocols
File Transfer Protocol (FTP)
Security.

3. Intranets

Intranet
Intranet Services
Intranet Implementation

4. Electronic Data Interchange

Electronic Data Interchange
Components of EDI Systems
EDI Software.

5. Identification & Tracking Tools for E-Commerce

The EAN System
EAN/COM
Article Numbering
Bar Coding

6. Internet Bandwidth and Technology issue

Bandwidth Issues
Technology Issue for the Internet
ATM Technology
ATM / Fiber-Optic Networks
High capacity Storage System

7. Security Issues

Security Concerns
Security Solutions
Electronic Cash over the Internet

Reference Books:

1. E-Commerce The Cutting Edge of Business – Kamlesh K. Bajaj, Debjani Nag.(TATA McGRAW HILL)

Advanced Database Management System Concepts

Marks:50

Lectures:40

Subject code: ICT 4-3

Topics

Review of Database Management System Concepts

Types of database, data models- ER-model, Normalization (1NF, 2NF, 3NF, BCNF, 5NF)

Data Storage & Indexing techniques : Architecture of DBMS, Storage of data on disk & files, File organization & type ,of file organization, Advanced storage devices – RAID, Types of Indexing

SQL query processing and optimization: Relational algebra, Implementation and Evaluation of relational operations, Types of joins and join algorithms, Cost estimation and cost based optimization, Plan evaluation

Review of Transaction Management: Introduction to transaction management (ACID property, states of transaction).Concurrency control (locked based concurrency control, optimistic concurrency control, timestamp based concurrency control, deadlock detection & handling).Crash recovery , needs , standard techniques (log based recovery, shadow paging , etc)

Security: General defense model, identification & authentication, authorization matrix, views, encryption techniques, statistical database, role of DBA, Integrity Constraints

ORACLE Database Architecture :Overview of database ,Instance, Tablespaces, Datafiles, Other files, Oracle managed files ,Users, Schemas, Indexes, Clusters, Hash clusters, View, Sequences ,Synonyms, Snapshots, Procedure, Functions, Privileges, Roles ,Internal memory structure, SGA, PGA, Context areas, Background processes ,External structure, Redo logs, Control files, Trace files, Alert logs, Creating, database manually

Reference Books

1. Database Management System, Raghuramkrishnan, Gehrke McGraw Hill .
2. Database System Concepts (se) ,Silberschatz, Korth, Sudarshan , MGHill.
3. Introduction to Database System ,C.J. Date
4. Fundamentals of Database systems (fourth edition) ,Elmaris, Nawathe ,Pearson
5. Oracle Architecture : Oracle Press

DATA STRUCTURES

MARKS:50

LECTURES – 40

Subject code: ICT 4-4

1. Introductions and Overview:

- 1.1 Introduction
- 1.2 Basic technology, elementary data organization
- 1.3 Data structure
- 1.4 Data structure operation
- 1.5 Notation and Concept of algorithm

2. Array, Records and Pointers:

- 2.1 Introduction
- 2.2 Linear array
- 2.3 Representation of linear array in memory
- 2.4 Traversing linear array
- 2.5 Inserting and Deleting
- 2.6 Sorting methods
- 2.7 Searching methods (Binary and linear search)

3. Linked List:

- 3.1 Introduction
- 3.2 Linked list
- 3.3 Representation of Linked list in memory
- 3.4 Searching a linked list
- 3.5 Memory allocation, Garbage collection
- 3.6 Insertion and deletion in linked list

4. Stacks, Queues, Recursion:

- 4.1 Introduction
- 4.2 Stacks
- 4.3 Array representation of stacks
- 4.4 Arithmetic expression
- 4.5 Recursion
- 4.6 Queues

5. Tree:

- 5.1 Introduction
- 5.2 Terminology of Binary tree
- 5.3 Types of Binary tree
- 5.4 Traversing of binary tree
- 5.5 Header Nodes, Threads

6. Sorting:

- 6.1 General Tree Introduction
- 6.2 Selection, bubble, insertion

Reference Books:

1. DATA STRUCTURE, BY SEYMOUR LIPSCHUTZ (SCHAUM'S OUTLINE SERIES IN COMPUTERS) – TMH
2. AN INTRODUCTION TO DATA STRUCTURE WITH APPLICATION BY JEANPAUL, TREMBLAY PAUL, G. SORENSON TMH

LAB VII**Subject code: ICT4-5 P**

Section A: A Case Study on Computer System Security.

Section B : 20 problems or Programs of Advance DBMS concept.

LAB VIII**Subject code: ICT4-6 P**

Section A: A Case Study on E-Commerce.

Section B : 20 programs on Data Structure by using C++ programming.

Network Essentials

MARKS:50

LECTURES – 40

Subject code: ICT 5-1

Topics

Introduction to Network: Uses of Computer Networks, Network Hardware, LAN, MAN, WAN, Wireless Networks, Network Software.

LAN Hardware : Network Interface Card , Drivers , Magnetic Media, Twisted Pair Cable, Coaxial Cable, Fiber Optic Cable, Network Topologies-Bus Ring, Star, Tree and other Topologies , Networking Devices-Repeaters, Bridges, Routers, Gateways, Hub and Switch.

LAN Software: Client-Server Model, File Server, Database Server, Print Server, DHCP Server, DNS Server, Peer-TO-Peer Networks

Multiplexing and Switching: Concept of modulation and their application, Multiplexing-Time division and Frequency division, Switching, Circuit Switching, Packet Switching, Message Switching

Network Standards and Network Protocols: OSI Reference Model, - Protocol Hierarchy, Design and issues for layer, TCP/IP reference model services, header, short overview of TCP Connection Establishment and Termination , TCP Interactive Data Flow

Network Standards and Network Protocols: IP Protocol, SMTP, PPP, FTP, HTTP, SNMP, IP addresses, DNS

Internet : Definition, Internet Verses Intranet , Internet Service Providers , E-mail-Architecture and Services ,WWW- Client side and Server Side ,URL, Messengers, Search Engine.

Ethernet Technology (802.3) : Overview of Ethernet. , 10 Mbps IEEE Standards, 100 Mbps IEEE Standards.

Reference Books:-

1. Local Area Network , Gerd E. Keiser ,Tata McGraw Hill
2. Local Area Network , Peter Holdson , BPB Publication Fifth Edition
3. Data and Computer Communication William Stallings , Fifth Edition
4. Computer Network , A.Tennumbum , Fourth Edition

1. The Product:

The Evolving Role of Software

Software: Software Characteristics, Software Applications, Software Crisis & Horizon, Software Myths

2. Process Of Software

Software Engineering, Software Process

Software Process Model, Linear Sequential Model, Prototyping Model, Evolutionary Process Model, Spiral Model

3. Management Concepts

Management Spectrum

The People, The Product, The Process, The Project

People: Players, Leaders & Software Team

4. Software Process & Project Metrics

Measures, Metrics & Indication, Metrics In The Process & Project Domains

Software Measurement, Metrics For Software Quality

5. Software Project Planning

Observation Estimation, Project Planning Objectives, Software Scope, Resources

Software Project Estimation

6. Risk Analysis & Management

Software Risks, Risk Identification, Risk Projection, Risk Assessment, Risk Management

7. Quality Assurances

Quality Concepts, Software Quality Assurance, Formal Technical Reviews

8. Testing Techniques

Software Testing Fundamentals, White Box Testing, Black Box Testing

9. Software Testing Strategies

A Strategic Approach To Software Testing

Unit Testing

Integration Testing

Top-Down Integration

Bottom Up Integration

Reference Books:

1. SOFTWARE ENGINEERING (A PRACTITIONER'S APPROACH) BY ROGERS PRESSMAN (FIFTH EDITION)

2. SOFTWARE ENGINEERING (A PRACTITIONER'S APPROACH) BY ROGERS PRESSMAN (FOURTH EDITION)

VB.NET programming

Marks: 50

Lectures: 40

Subject Code: ICT 5-3

- 1. Welcome to Visual Basic.NET :** Windows versus Dos programming, Installing Visual Basic.NET IDE, Creating a simple Application Using the Help system
- 2. The Microsoft.Net Framework:** Microsoft's Reliance on windows, Writing software for windows, Common Language Runtime, the common type system and common Language specification.
- 3. Writing Software's:** Information and data, variables, comments and white space , Data types, storing variables, Methods.
- 4. Controlling the flow:** Making decisions, the if statement, Select case, Loops.
- 5. Working with data structures** – Understanding Arrays, understanding Enumerations, understanding constants, structures, Working with collections and Lists, Building lookup table with Hash table, Advanced array manipulation
- 6. Building Windows Applications :** Responding to Events, Building sample Application.
- 7. Displaying Dialog Boxes-** The message Dialog Box, T he open dialog control, the save dialog control, the Font Dialog control, the color dialog control, the print dialog control.
- 8. Creating Menus** – Understanding Menu Features, creating menus, context menus.
- 9. Debugging and Error Handling:** Major Error types, Debugging, Error Handling.
- 10. Building Objects:** Understanding objects, Building Classes, Reusability, our first object, constructors, Inheritance, The framework classes.

Text Books:

1. Beginning VB.NET 2003; Willis ,Cross Land and Blair.
2. ASP.net & VB.net web programming- Math J. Croush (Pearson Education)

RDBMS Through Oracle 8i

Marks 50

Lectures 40

Subject Code: ICT 5-4

1. Introduction and Basic Concepts

Structure of DBMS, Advantages & Disadvantages, Relational and their schemes integrity rules.

Relational algebra: Basic operations additional operations, relational algebraic operations,

Relational Calculus: Tuple Calculus domain calculus, Physical Implementation Issues

2. Object Oriented Database

The Basic Parts of Speech in SQL, The basic Objects –Relational Database

3. SQL and SQL * Plus

Basic SQL PLUS Reports and Commands, Building a simple report, Checking the SQLPLUS Environment, Getting Text information, Data Types, How to cut and paste String, Group Value function, Dates, Conversion and transformation function, Advances sub queries, other joins

4. Some Complex possibilities

Creating a complex view, Using sub queries within form clause, Using ROLLUP, GROUPING, And CUBE, Advances use of function and variables, DECODE: Amazing power in a single word, Creating, Dropping and Altering tables Views

5. Security and Management Using SQL

Users roles and Privileges, What user can grant

6. PL/SQL

An Introduction to PL/SQL

PL/SQL Overview, Declaration section, Executable Commands section

Condition logic, Loops, Exception Handlings

Triggers

Required System Privileges, Required Table Privileges, Types of triggers

Triggers Syntax, Enabling and Disabling Triggers, Replacing and Dropping Triggers

Reference Books:

1. Bipin Desai "An introduction to Database system", Golegia publication NEW Delhi
2. Abraham S. Henry Korth S. Sudarshan "Database system Concepts" TMH
3. Kevin Lonely and George Koch "Oracle 8i the complete reference" TMH

LAB IX

Subject code: ICT5-5 P

Section A: A Case Study on Network Essential.

Section B : 20 problems or Programs of VB .Net.

LAB X

Subject code: ICT5-6 P

Section A: A Case Study on Software Engineering.

Section B : 20 problems or programs on oracle 8i.

Sixth Semester

The Sixth Semester is devoted entirely to project work, which is usually taken up by the students at software industries and research institutions, thereby enabling them to have industrial and R & D exposure. This not only gives the students an opportunity to work in a challenging environment with state-of-the-art technology, but also, supplements their work culture through which they gain of managerial and technical skills.

TCP/IP

MARKS 50

Lectures 40

Subject Code: ICT 7-1

1 Introduction and Overview

The Motivation for Internetworking, The *TCPIIP* Internet, Internet Services History and Scope of the Internet, The Internet Architecture Board, The IAB Recognition, The Internet Society

2 Reviews of Underlying Network Technologies

Introduction, Two Approaches to Network communication, Wide Area and Local Area Network, Ethernet Technology, Fiber Distributed Data Interconnect (FDDI)

3 Internetworking Concept and Architecture Model

Introduction, Application Level Interconnection, Properties of the Internet. Network – Level Interconnection, Internet Architecture.

4 Internet Addresses.

Introduction, Universal Identifiers, Three Primary Classes of IP Addresses, Addresses Specifies Network Connections, Network and Broadcast, Limited Broadcast

5 Internet Protocol: Connectionless Data gram Delivery

Introduction, A Virtual Network, Internet Architecture and Philosophy, The Concept of Unreliable Delivery, Connectionless Delivery System. Purpose of the Internet Protocol, The Internet Data gram.

6 Reliable Stream Transport Service (TCP)

Introduction, The Need for Stream Delivery. Properties of the Reliable Delivery Service, Providing Reliability, The Idea behind Sliding Windows, The Transmission Control Protocol, Connections and Endpoints.

7 TCP/IP Over ATM Networks

Introduction, ATM Hardware, Large ATM Networks,

8. Mapping Internet Addresses To Physical Addresses (ARP)

Introduction, The address resolution problem, Two types of Physical Addresses, Resolution through direct mapping, Resolution through dynamic binding, The address Resolution cache.

9.Determining an Internet Address at Startup (RARP)

Introduction, Reverse Address Resolution protocol Timing RARP Transactions

Books Recommended :

1. Internetworking with TCPIIP, PriDc,T,les, Protocols & Architecture By- Douglas E.Comer (PHI) (Vol-1, 3 Ed.)
2. Internetworking with TCPIIP, Principles, Protocols & Architecture By- Douglas E. Comer (Vol-1. 4th Ed.) (LPE) (Pearson Education)

JAVA Programming

Marks 50

lectures: 50

Subject Code: ICT 7-2

1. Introduction

Introduction to Java - Features of Java - Object oriented concepts - Data types - Variables - Arrays -Operators - Control statements

2. Basics of Java

Classes - Objects - Constructors - Overloading method - Access control - Static and final methods -Inner Classes - Inheritance - Overriding methods - Using super abstract class-- String class-String objects - String buffer - Char Array

3. Packages and Interfaces

Packages , Access protection , Importing packages, Interfaces

4. Exception Handling

Exception-Handling fundamentals, Exception types, uncaught exceptions, using try and catch, Multiple catch clauses, Nested try statements, throw, throws, finally, Java's Built in Exceptions

5. Applets

Applet basics, Applet architecture, applet skeleton, simple applet display methods, Requesting repainting, Using the status window, the Html APPLET Tag, get Document Base and get Code Base

6. Input/Output &Networking

Networking Basics, Java and the Net, Inet Address, TCP/IP client sockets, url connection, TCP/IP server sockets, Datagram

7. Multithreaded programming

The Java Thread Model, Thread priorities, synchronization, messaging, the thread class and run able interface, creating a thread, creating multiple threads, thread priorities, suspending resuming and stopping threads

8.Using Awt, Layout managers and menus

Control fundamentals ,labels, Using Buttons ,Applying check boxes, checkbox group, choice controls, Using Lists, Managing scrollbars, Using a Text field, Using a Text area ,Understanding Layout managers

TEXT BOOKS

1. Naughton and H.Schildt - "**Java 2 - The complete reference**" - Fourth edition.-2002
2. S.Horstmann, Gary Cornell - "**Core Java 2 Volume I - Fundamentals**" - Addison Wesley – 2001
3. Arnold and J.Gosling - "**The java programming language**" - Second edition Art
4. Gittleman – "**Ultimate Java Programming**" –Wiley Publications-2002

Project Management

Marks 50

lectures: 40

Subject Code: ICT 7-3

1. Concept of Project Management:

Meaning of project, characteristics of a project, project levels, types of projects, meaning & phases of project management, project interface management.

2. Project Formulation:

Feasibility analysis, technical analysis, profitability analysis and financial analysis-cost of project, means of financing & estimates of sales & production.

3. Risk & Uncertainty Decisions:

Sensitivity analysis, break even analysis, cost of capital and capital budgeting.

4. Project Scheduling & Control:

Meaning of project scheduling & project control, network techniques to project management –PERT & CPM, Gantt charts.

5. Introduction to Software Project Management:

The nature of software production, key objectives of effective management, quality, productivity, risk reduction, the role of the software project manager.

6 . Project Management Information System (PMIS):

Significance of PMIS in project management, planning & control, Design of project management information system, importance of materials & equipment in PMIS.

Texts Books:

1. **Project Management** - By S. Chaudhary, Tata McGraw Hill.
2. **Project – Preparation, Appraisal, Budgeting & Implementation** - Prasanna Chandra, Tata McGraw Hill.
3. **Project Management – A Development Perspective** - B.B. Goel, Deep & Deep.
4. **Project Management** – Vasant Desai
5. **Principles of software Engineering Management** – Tom Gilb, finzi Susannah Addison-Wesley, England, 1988.
6. **“Managing A Programming Project”** -Prentice Hall, New Jersey, 1981.

Artificial Intelligence

Marks: 50

Lectures: 40

Subject code : 7-4

Topics

Conventional AI - Reasoning and Belief Systems , Logical Inference , Reasoning Patterns in Propositional Logic, Propositional inference, Predicate calculus, Predicate and arguments, ISA hierarchy, Frame notation, resolution, Natural deduction etc.

(Theoretical, Mathematical perspective is expected)

Reasoning under Uncertainty ,Belief and uncertainty handling mechanisms, certainty, possibility and probability, Dempster Schaeffer theory , fuzzy inference, structure knowledge representation, semantic net, Frames, Script, Conceptual dependency etc.

Goal Driven Intelligence(Planning, Search and Perception) , *Planning*: formulation of Planning Problem, decomposition, representation of states, goals and actions, action schema, partial order planning, planning graphs Block world, strips, Implementation using goal stack, Non linear Planning with goal stacks, Hierarchical planning, List Commitment strategy.

Game Playing and Search: Search techniques: Breadth first, depth first, Hill climbing, Generate and test, Heuristic search techniques. Best first search, mean and end analysis, A* and AO* Algorithm, Minimize search procedure, Alpha beta cutoffs, waiting for Quiescence, Secondary search, *Perception* - Action, Robot Architecture, Vision, Texture and images, representing and recognizing scenes, waltz algorithm, Constraint determination, Trihedral and non trihedral figures labeling

Expert systems , Utilization and functionality, architecture of expert system, knowledge and rule bases, rule chaining strategies, conflict resolution, RETE algorithm, uncertainty handling in expert systems

Evolutionary Algorithms, Evolutionary paradigms, genetic algorithms and genetic programming, Ant colonies & optimization, evolutionary search strategies.

Agents , internet and Soft bots ,Interface agents and reactive systems , Soft bots and info agents, the three layer model , process automation and agents

Reference Books

1. AI, a modern approach Russell and Norvig:
2. AI, Winston
3. Mathematical Methods in Artificial Intelligence , Bender
4. Reasoning about Intelligent Agents, Woolbridge
5. Artificial Intelligence, Elaine Rich and Kerin Knight:
6. Artificial Neural Network, Kishen Mehrotra, Sanjay Rawika, K Mohan

LAB XI

Subject code: ICT7-5 P

Section A: A Case Study on TCP/IP.

Section B : 20 Programs of Java.

LAB XII

Subject code: ICT7-6 P

Section A: A Case Study on Project Management.

Section B : 20 programs on Artificial Intelligence by using LISP or Prolog.

ICT for Rural –Socio Economic Development

Subject code : **ICT 8-1**

Topics

ICT and Rural Development in India

ICT for Rural Community Development

Information and Communication Technologies (ICT) and Sustainable Development
The Role of e-Panchayats

Developing IT Networks in Rural India

Communication and Information Technology in Literacy for Rural Development
Rural Entrepreneur Development Programme in Information and Communication Technology
(REDPRINT)

Effect of Mobile Telephony on Empowering Rural Communities in Developing Countries

Warana: The Case of an Indian Rural Community Adopting ICT

Selected Success Stories on Agricultural Information System

The Diffusion of the Internet and Rural Development

Bridging Digital Divide in Marginalized Areas: A Focus on IT Policy, Planning and Implementation Issues in Malaysia

Wiring Sub-Saharan Africa for Development

Rural Schools as Regional Centres of e-learning and the Management of Digital Knowledge: The Case of Newfoundland and Labrador

Reference Books

ICT in Rural Development: An Overview, By Sukhvinder Kaur Multani , Publisher: ICFAI ,ISBN: 8131408337

Other Readings

ICTs and Indian Social Change: Diffusion, Poverty, Governance by [Ashwani Saith](#) , [M Vijayabaskar](#), [V Gayathri](#) , Publisher: SAGE Publications ,ISBN-13: 9780761936121

NEURAL NETWORKS

Max Marks: 50

Lecturers: 40

Subject code: ICT 8-2

1 Neural Networks

- 1.1 History of Neural Networks development. Introduction to expert systems,
- 1.2 Expert system vs neural networks. Biological Neurons, Artificial Neurons – Activation
- 1.3 Functions. Neural Networks concepts and architecture. Knowledge representation in neural networks. Artificial Intelligence and Neural Networks.

2. Learning Methods:

- 2.1 Categories of Learning – Supervised/ Unsupervised and Reinforcement learning
Memory based learning.
- 2.2 Hebbian learning. Competitive learning. Boltzman learning,Statistical learning.

3. Neural Networks Models

- 3.1 Single Layer Perception
- 3.2 Least mean square algorithm perception Convergence theorem

4. Multi layers perception

- 4.1 Introduction.
- 4.2 Back propagation Algorithm.
- 4.3 Stopping Criteria
- 4.4 Complexity of learning Generalization.

5. Hopfield Model

- 5.1 The Hopfield learning algorithm and its limitations.
- 6. Self Organizing Network
 - 6.1 Introduction.
 - 6.2 The Kohonen algorithm.
 - 6.3 Neural networks applications.

7. Models and Processing

- 7.1 Biological Neurons and their artificial models
- 7.2 Models of Artificial Neural Networks
- 7.3 Neural Processing
- 7.4 Learning and Adaptation
- 7.5 Neural Network Learning Rules

References:

- 1. Simon Hayking: Neural Networks- A Comprehensive Foundation, Pearson Education , India, Second Edition, 2001.
- 2. Limin Fu: Neural Networks in Computer Intelligence, TMH
- 3. Introduction to Artificial Neural Systems , Jacek M. Zurzda , Jaico Publishing House

Data Warehouses and Data Mining

Marks: 50

Lectures: 40

Subject code : ICT 8-3

Topics: Data Warehousing

Overview and Concepts: Need for data warehousing, Basic elements of data warehousing, Trends in data warehousing. Planning And Requirements: Project planning and management, Collecting the requirements.

Architecture And Infrastructure: Architectural components, Infrastructure and metadata. Data Design And Data Representation: Principles of dimensional modeling, Dimensional modeling advanced topics, data extraction, transformation and loading, data quality

Information Access And Delivery: Matching information to classes of users, OLAP in data warehouse, Data warehousing and the web. Implementation And Maintenance: Physical design process, data warehouse deployment, growth and maintenance

Topics: Data Mining

Introduction: Basics of data mining, related concepts, Data mining techniques. Data Mining Algorithms: Classification, Clustering, Association rules. Knowledge Discovery: KDD Process.

Web Mining: Web Content Mining, Web Structure Mining, Web Usage mining. Advanced Topics: Spatial mining, Temporal mining.

Visualization: Data generalization and summarization-based

Characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases

Data Mining Primitives, Languages, and System Architectures: Data mining primitives, Query language, Designing GUI based on a data mining query language, Architectures of data mining systems

Basic Books:

1. Paulraj Ponniah, "Data Warehousing Fundamentals", John Wiley.
2. M.H. Dunham, "Data Mining Introductory and Advanced Topics", Pearson Education.
3. Han, Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann
4. Pieter Adriaans, Dolf Zantinge , "Data Mining", Pearson Education Asia

Reference Books

1. Ralph Kimball, "The Data Warehouse Lifecycle toolkit", John Wiley.
2. M Berry and G. Linoff, "Mastering Data Mining", John Wiley.
3. W.H. Inmon, "Building the Data Warehouses", Wiley Dreamtech.

Compiler Design

Marks: 50

Lectures 40

Subject code: ICT 8-4

1. Introduction to Compilers:

- 1.1. Compilers and translators
- 1.2. The structure of compiler
- 1.3. Compiler writing tools

2. Programming Languages

- 2.1 High level programming languages

- 2.2 Definitions of programming languages
- 2.3 A lexical and syntactic structure of a language
- 2.4 Data structures
- 2.5 Operators
- 2.6 Statements

3. Lexical Analysis & Syntax Analysis:

- 3.1 Lexical analysis
- 3.2 Role of a Lexical analyzer
- 3.3 A simple approach to the design of lexical analyzer
- 3.4 regular expressions
- 3.5 Syntax analysis
- 3.6 Finite automata
- 3.7 Minimizing number of states of a DFA
- 3.8 Implementation of a lexical analyzer
- 3.9 Context free grammars

4. Basic parsing techniques

- 4.1 Introduction to parsers
- 4.2 Shift reduce parsing
- 4.3 Top-down parsing
- 4.4 Operator Precedence parsing
- 4.5 Predictive parsers
- 4.6 LR, SLR and LALR parsers.

5. Syntax Directed Translation:

- 5.1 Introduction
- 5.2 Syntax directed Schemes
- 5.3 Implementation of Syntax directed translators
- 5.4 Intermediate code
- 5.5 Postfix notation and evaluation of postfix expressions
- 5.6 Parse trees and syntax trees

6. Symbol Tables

- 6.1 The contents of a symbol table
- 6.2 Data structures for a symbol table

RECOMMENDED BOOKS :

1. Principals of Compiler Design By Alfred V. Aho, Jeffrey D. Ullman
2. Compilers - Principles, Techniques and Tools - A.V. Aho, R. Shethiand J.D.
3. Introduction to system softwere By D. M. Dhamdhere

LAB XIII

Subject code: ICT8-5 P

Section A: A Case Study on ICT for Rural Socio Economic Developments.

Section B : 20 problems or Programs on Neural Network.

LAB XIV

Subject code: ICT8-6 P

Section A: A Case Study on Compiler Design.

Section B : 20 problems or programs on Data warehouse and Data mining.

Subject code: ICT 9-1

1. Introduction

- 1.1 Comparison of various operating systems
- 1.2 Advantages of Linux, Flavors of Linux, Installation notes, Linux Loader, Linux kernel

2. File System and Devices

- 2.1 File System concept
- 2.2 Concepts of Devices
- 2.3 Various kinds of Hardware: - Hard disk, floppy disk drivers, CD-ROM drives, Mouse,
- 2.4 Memory devices, Printer devices
- 2.5 File systems: - mount, fsconf and other related commands

3. Linux commands and Utilities

- 3.1 Study of following commands and utility :
- 3.2 Adduser, alias, at, atrm, banner, batch, bind, cat, cd, chmod, chown, chroot,
- 3.3 cp, cpio, dc, dd, df, dir, du, dump, ex, fax, fc, fdformat, file,
- 3.4 find, finger, grep, gunzip, gv, gvim, gzip, halt, hostname, ifconfig, kill, ln, locate, login, logout, look, lpc, lpd, lp, rm, ls, mail, man, mcopy, mdel, mdir, mformat, mkdir,
- 3.5 mlabel, more, mount, mt, mv, netcft, netstat, passwd, ping, ps, pwd, quota, quotaoff, rm, rmdir, route, set, shut down, sort, stat, strings, su, tar, tree, umount, unzip, vdir, vi, view, wc, who, whoami, xload, xset, zip.

4. System Administration

- 4.1 Performing system maintenance
- 4.2 Communication commands :- write, wall, talk, mesg, motd,
- 4.3 Pre-login Message
- 4.4 Managing software with RPM :- Installing, Uninstalling, Upgrading
- 4.5 Managing users and Groups with linuxconf and control – panel: - Adding users,changing user-password, removing users

5. Backup and Restore

- 5.1 Backup Strategies and Operations
- 5.2 Restoring files

6. Network configuration for Linux

- 6.1 Introduction, Configuration examples for Linux
- 6.2 DHCP configuration for Linux, PPP configuration for Linux
- 6.3 Dynamic reconfiguration and tuning for Linux

Recommended Books:

- 1. Bill Ball, David Pitts, “Red Hat Linux 7 Unleashed”, Techmedia SAMS Publication
- 2. Evi Nemeth, Garth Snyder, Scott Seebass, Trent R. Hein, “UNIX System Administration Handbook” Person Education Asia (LPE) (IIIrd Edition)

Network Security

Marks 50

Lectures 40

Subject code: ICT 9-2

UNIT-I:

Introduction, Security Concepts, Threats and Risks, Attacks – Passive and Active, Security Services, Confidentiality, Authentication, Non-Repudiation, Integrity, Access Control, Availability, Model for Internetwork Security, Internet Standards and RFCs Access Control Mechanisms ,Access Matrix, HRU, TAM, ACL and capabilities

UNIT-II:

Access Control Models, Chinese Wall, Clark-Wilson, Bell-LaPadula, Non- Interference and Role Base Model,Cryptography, Secret Key and Public Key Cryptosystems, Symmetric Ciphers, Block Ciphers and Stream Ciphers, DES, IDEA and Key Escrow, RSA and ElGamal

UNIT-III:

Secure Hash and Key management, Digital Signature and Non-repudiation, cryptanalysis. Network Security, Objectives and Architectures, Internet Security Protocols, IP encapsulating Security Protocol, Network and Transport Layer Security

UNIT-IV:

Network Security Applications, Authentication Mechanisms: a) Passwords, b) Cryptographic authentication protocol, c) Smart Card, d) Biometrics,e) Digital Signatures and seals, f) Kerberos, g) X.509 LDAP Directory. Web Security : a) SSL Encryption b) TLS, SET

UNIT-V:

E-mail Security, PGP's / MIME, IP Security, Access and System Security , Intruders, Intrusion Detection and Prevention , Firewall a) Hardware Firewall b) Software Firewall c) Application Firewall d) Packet Filtering. e). Packet Analysis , Proxy Servers, Firewall setting in Proxy, ACL in Proxy

References :

- 1 William Stallings, "Network Security Essentials", Prentice-Hall.
- 2 Edward Amoroso, "Fundamentals of Computer Security Technology", Prentice-Hall.
- 3 Dorothy E. Denning, "Cryptography and Data Security", Addison-Wesley.
- 4 Peter J. Denning, "Computers under Attack", Addison-Wesley.
- 5 Douglas R. Stinson, "Cryptography: Theory and Practice", CRC Press.
- 6 D. Brent Chapman and Elizabeth D. Zwicky, "Building Internet Firewalls", O'Reilly and Associates

MOBILE COMMUNICATION

MARKS 50

Lectures40

Subject code: ICT 9-3

1. Introduction to Cellular Mobile Systems

- 1.1 Introduction
- 1.2 Basic Cellular System
- 1.3 Performance Criteria
- 1.4 Operation of Cellular System
- 1.5 Planning a Cellular System
- 1.6 Analog Cellular System
- 1.7 Digital Cellular System

2. Wireless Communication

- 1.1 Application
- 1.2 History
- 1.3 Market for Mobile Communication
- 1.4 Some open research topics
- 1.5 Simplified reference model

3. Medium access control

- 1.1 Motivation for specialized MAC
- 1.2 SDMA
- 1.3 FDMA
- 1.4 TDMA
- 1.5 CDMA
- 1.6 GSM

4. Wireless LAN

- 1.1 Infra red Vs radio transmission
- 1.2 Infrastructure and ad hoc Network
- 1.3 IEEE 802.11
- 1.4 HIPERLAN
- 1.5 Bluetooth

5. Mobile Network Layer and Transport Layer

- 1.1 Mobile IP
- 1.2 Traditional TCP
- 1.3 Classical TCP Improvements

Books recommended:

1. Mobile Communications Second Edition – By Jochen Schiller (Pearson Education)
2. Mobile Cellular Telecommunications Second Edition-By William C.Y.Lee - TMH

Digital Image Processing

Marks: 50

Lectures: 40

Subject code: ICT 9-4 A

1. Introduction

6 Hrs.

Elements of Digital Image Processing Systems
Elements of Visual Perception
Brightness, Adaption and Discrimination
Color Representation
Statistical background

2. Fundamentals of Image Processing

6 Hrs.

Digital image Representation
Reading, Displaying, Writing Images
Data Classes, Image Types
Coverting Between data classes and Image Types
Introduction to M Function Programming

3. Intensity Transformation and Spatial Filtering

8 Hrs.

Background
Intensity Transformation Function
Histogram Processing and Function Plotting
Spatial Filtering

4. Frequency Domain Processing

7 Hrs.

2-D Discrete Fourier Transform
Computing and Visualizing the 2D DFT in Matlab
Filtering in the frequency domain

5. Image Restoration

7 Hrs.

A model of the image Degradation / restoration process
Noise Models
Geometric Transformation and Image registration

6. Introduction to Matlab

6 Hrs.

Advantages and Disadvantages of Matlab
Matlab Environment, Using Matlab scratch pad
Variable and arrays
Multidimensional Arrays
Scalar and array operation

Reference Books :

1. Digital Image Processing and Algorithmic Approach By Madhri A Joshi (PHI)
2. Digital Image Processing Using Matlab By Rafael C Gonzalez, Richard E Woods, Steven L Eddins
3. Fundamentals of Digital Image Processing By Anil Jain (Pearson)
4. Matlab Programming for Engineers(IE) By Stephen J Chapman (Thomson)

Soft Computing

Marks:50

Lectures : 40

Subject code : ICT 9-4 B

Topics

Foundations of intelligent and soft computing

Crisp Sets: an Overview : Fuzzy Sets: Basic Types ,Fuzzy Sets: Basic Concepts , Fuzzy Sets Vs Crisp Sets ,Additional Properties of alpha cuts ,Presentation of fuzzy sets , Extension principle for fuzzy sets

Operations on Fuzzy Sets: Fuzzy complements, Fuzzy Union, Fuzzy Intersections, Crisp & Fuzzy Relation, Binary Fuzzy Relation, Binary Relation on single set, Fuzzy Equivalence Relations, Fuzzy Compatibility Relation

Associative Memories : Auto Associative Memory ,Bidirectional Associative Memory (BAM) , Matrix Associative Memory ,Hetro Associative Memory ,Fuzzy System and Neuro Fuzzy System :Fuzzy neurons ,Fuzzy Neural Network ,, Fuzzy associative memory

Application of Fuzzy Sets and Neural Network : Application in Pattern Recognition , Character, Face, Finger, Palm, Iris Recognitions , Application in Expert System

Reference Books

A Must read: P. Erdi, "Complexity Explained," Springer, 2007. ISBN-13 978-3-540-35777-3 [PE]

Basic introductory Books:

1. **Fuzzy Sets and Fuzzy Logic Theory and Application** By- George J. Klir, Bo Yuan
2. **Fuzzy Sets Uncertainty and Information** By- George J. Klir, Tina A. Floger
3. **Neural Network and Fuzzy System** -A Dynamic SystemBy- Koska PHI Edition

Additional Resources:

1. Fuzzy Sets and Fuzzy Logic Theory and Application By- George J. Klir, Bo Yuan
2. Fuzzy Sets Uncertainty and Information By- George J. Klir, Tina A. Floger

Multimedia Systems

Marks : 50

Lectures: 40

Subject code: ICT 9-4 C

1. Introduction

6Hrs.

CDROM and Multimedia Highway

Applications of Multimedia

Stages of Multimedia Project

2. Macintosh and Windows Productions Platforms

7Hrs.

Macintosh Platform

Windows Platform

Connections- SCSI and IDE

Memory and Storage devices

Input and Output Devices

3. Basic Software Tools

8Hrs.

Text editing and word Processing tools

Painting and drawing tools

Image Editing Tools

Sound Editing Tools

4. Text

6Hrs.

Fonts and faces : Cases , Serif versus sanserif

Using text in multimedia

Computers and text

Font Editing and designing tools

Hypermedia nad Hypertext

5. Sound and Images

7Hrs.

MIDI Versus Digital Audio

Digital audio

Audio file formats

Making Still Images : BITMAPS , Vector Drawing

Colors

Image file formats

6. Animation and Video

8Hrs.

Principal of Animation

Making animation that work : Rolling Ball ,Bouncing ball

Using Video

Broadcast Video Standards

Recording Formats

References Books

1. Multimedia : Making it work (5th Editions) By Tay Vaughan (Tataamc)
2. Multimedia : Computing Communications and Applications By Ralf Steinmetz , Klara Nahrstedt

LAB XV**Subject code: ICT9-5 P**

Section A: A Case Study on Network Security.

Section B : 20 problems or Programs on Linux operating System.

LAB XVI**Subject code: ICT9-6 P**

Section A: A Case Study on Mobile computing.

Section B : 20 problems or programs on Elective.

Tenth Semester

The Tenth Semester is devoted entirely to project work, which is usually taken up by the students at software industries and research institutions, thereby enabling them to have industrial and R & D exposure. This not only gives the students an opportunity to work in a challenging environment with state-of-the-art technology, but also, supplements their work culture through which they gain of managerial and technical skills.

**[III] Course Curriculum of Five Years Integrated Dual Degree
[B. Sc and M. Sc. (ICT)] :**

Tentative Course Schedule :The Schedule will be revised every semester

B.Sc (ICT)

First Semester:

Sr.No.	Course Code	Title of the Paper	No. of Credit
1	ICT1-1 T	Communication Skills- I	4
2	ICT1-2 T	Discrete Mathematics	4
3	ICT1-3 T	Fundamentals of Computer	4
4	ICT1-4 T	Programming in C	4
5	ICT1-5 P	Desc. Math Lab	4
6	ICT1-6 P	C Programming Lab	4

Second Semester:

Sr.No.	Course Code	Title of the Paper	No. of Credit
1	ICT1-1 T	Communication Skills- II	4
2	ICT1-2 T	Statistical Methods	4
3	ICT1-3 T	Digital Electronics	4
4	ICT1-4 T	8085 Microprocessor	4
5	ICT1-5 P	Statistical Method Lab	4
6	ICT1-6 P	8085 Micro. Lab	4

Third Semester

Sr no	Course Code	Title of Course	No. of Credits
1	ICT3-1 T	Web Technology	4
2	ICT3-2 T	Advance C Programming	4
3	ICT3 -3 T	Operating System	4
4	ICT3 -4 T	Object Oriented Programming using C++	4
5	ICT3 -5 P	Advance C programming Lab	4
6	ICT3 -6 P	Object Oriented Programming Lab(C++)	4

Fourth Semester

Srno	Course Code	Title of Course	No. of Credits
1	ICT4-1 T	Computer System Security	4
2	ICT4-2 T	E-Commerce	4
3	ICT4 -3 T	Advanced Database Management System Concepts	4
4	ICT4 -4 T	Data Structure using C ++	4
5	ICT4 -5 P	Advanced Database Management System Lab	4
6	ICT4 -6 P	Data Structure using C ++ Lab	4

Fifth Semester

Srno	Course Code	Title of Course	No. of Credits
1	ICT5-1 T	Network Essentials	4
2	ICT5-2 T	Software Engineering	4
3	ICT5 -3 T	VB.NET programming	4
4	ICT5 -4 T	RDBMS Through Oracle 8i	4
5	ICT5 -5 P	Network & Software Eng. Lab	4
6	ICT5 -6 P	VB .NET & Oracle Lab	4

Sixth Semester

Srno	Course Code	Title of Course	No. of Credits
1	ICT6-1 R1	ICT10-1 R1	3
	ICT6-2 R2	ICT10-2 R2	3
	ICT6-3 R3	ICT10-3 R3	4
	ICT6-4 R4	ICT10-4 R4	8
2	ICT6-5 R5	ICT10-5 R5	1
	ICT6-6 R6	ICT10-6 R6	2
	ICT6-7 R7	ICT10-7 R7	3

M.Sc. (ICT)

Seventh Semester

Srno	Course Code	Title of Course	No. of Credits
1	ICT7-1 T	TCP/IP	4
2	ICT7-2 T	Programming in Java	4
3	ICT7 -3 T	Project Management	4
4	ICT7 -4 T	Artificial Intelligence	4
5	ICT7 -5 P	Artificial Intelligence Lab	4
6	ICT7 -6 P	Programming in Java Lab	4

Eighth Semester

Srno	Course Code	Title of Course	No. of Credits
1	ICT8-1 T	ICT for Rural – Socio Economic Developments	4
2	ICT8-2 T	Neural Network	4
3	ICT8 -3 T	Data Warehouses and Data Mining	4
4	ICT8 -4 T	Compiler design	4
5	ICT8 -5 P	Neural Network Lab	4
6	ICT8 -6 P	Data warehouse and data mining Lab	4

Ninth Semester

Srno	Course Code	Title of Course	No. of Credits
1	ICT9-1 T	Linux Operating System	4
2	ICT9-2 T	Network Security	4
3	ICT9 -3 T	Mobile Computing	4
4	ICT9 -4 T	Elective I 9-3 A T Digital Image Processing 9-3 B T Soft Computing 9-3 B T Multimedia Technology	4
5	ICT9 -5 P	Linux Operating System Lab	4
6	ICT9 -6 P	Elective I Lab	4

Tenth Semester

Srno	Course Code	Title of Course	No. of Credits
1	ICT10-1 R1	Major Project : Review 1	3
	ICT10-2 R2	Review 2	3
	ICT10-3 R3	Review 3	4
	ICT10-4 R4	Project (Final)	8
2	ICT10-5 R5	One Seminar : Review 1	1
	ICT10-6 R6	Review 2	2
	ICT10-7 R7	Seminar (Final)	3