

## COMPUTER SCIENCE

### **CSITI: Computer Fundamentals and Programming in C**

Total teaching Hours/Semester: 60

No of Lecture Hours/Week: 04

#### **1. Computer Fundamentals**

##### **Introduction to Computers (02)**

Evolution of Computers. Generation of Computers, Classification of Computers-Analog Digital and Hybrid Computers. Classification of Computers according to size-Super Computer, Mainframe Computers. Personal Computers (Different Types) and Terminals (Different Types). Characteristics of Computers. Block Diagram of Digital Computer.

##### **Introduction to Number system and Codes (03)**

Different number systems and their conversions (Decimal, Binary, Octal, and Hexadecimal). 1's complement and 2's Complement. Floating Point numbers. Coding BCD, Gray, ASCII and EBCDIC.

##### **Boolean algebra and Gate networks (05)**

Fundamental concepts of Boolean algebra, Inverter gates, AND gate, OR gate, NAND gate. NoR gate, X-OR gate, X-NOR gate, The universal property of NAND gate and NOR gate. Basic laws of Boolean algebra, DeMorgan's theorems, Simplification of Boolean expression Karnugh map (SOP)

##### **Combinational Logic (04)**

Adders (Half and Full), Decoder, Encoder, Multiplexer, De-multiplexer (Introductory Concepts only).

##### **Flip-Flops (04)**

Flip-Flops (SR flip-flops, D flip-flops, JK flip-flops), Edge-Triggered flip-flops and Master-Slave flip-flops, Introduction to Registers and Counters

##### **Computer Organization (02)**

Instruction format, Addressing modes, Instruction set.

##### **Memory (03)**

Memory Hierarchy, Primary Memory-Volatile and non-volatile memory. RAM and ROM EPROM and EEPROM. Secondary Memory-Floppy Disk and Hard Disk.

##### **Input/Output Devices (02)**

Input Devices-KeyBoard, Mouse, Output Devices-VDU Printers.

## **Introduction to Programming Concepts** (04)

Types of Programming Languages. Software, Classification of Software, Application software and System Software, Structured Programming Algorithms and Flowcharts with Examples.

## **II. Programming**

### **Introduction of C**

History of C Structure of a C program. The C character set Constants variables and keywords Types of C constants and variables.

### **C Instructions** (04)

Type declaration and arithmetic instructions, Integer and float conversions. Type conversion in assignment. Operators in C. Hierarchy of operations. Control Instructions Input/Output Statements in C (Formatted and Unformatted).

### **Control Structures** (04)

Decision control structures, Logical operators conditional operator and relational operators Loop control structures-While, do-while, for loop, Break statement, Continue statement switch-case control structure. Go to statement

### **Arrays** (04)

One dimensional and multidimensional array, Declaration, initialization, and Array Manipulations Sorting (Bubble sort) Strings-Basic Concepts, Library Functions.

### **Functions** (05)

Definition, function definition and prototyping types of functions, types of arguments. Recursion, passing arrays to functions Storage classes in C-Automatic, Register, Extern and Static Variables

### **Pointers**

(03)

Definition, Notation, Pointers and arrays, array of pointers, Pointers and functions-call by value and call by reference Pointers to pointers.

### **Structures and Unions**

(02)

Definition, declaration, accessing structure elements, Array of structures, structure in a structure, Pointers and structures, Unions-definition, declaration, accessing union elements Typedef Enum Bit fields.

Bitwise operators

(02)

Bitwise AND OR exclusive OR, complement, right shift and left shift operators

C preprocessor

(02)

Types of C preprocessor directives Macros, File Inclusion.

Files

File opening modes, Text and Binary files, High level and Low level operations on files.

Command Line Arguments.

### **Text Book for Computer Fundamentals**

1. Bartee Thomas C Digital Computer Fundamentals 6th Edition, 1995 TMH
2. Mano Morris M Computer System Architecture 196 Prentice Hall India Limited
3. Rajaraman V, Fundamentals of computers, 2nd Edition Prentice Hall India Limited.

### **Text Books for Programming in C**

1. Kanetkar, Yashwant Let us C 4th Edition BPB Publications
2. Balaguruswamy E Programming in Ansi C 2nd Edition Tata McGraw Hill

### **CSIPI: C PROGRAMMING LAB**

Total Practical Hours/Semester:45

No of Practical Hours/Week:03

#### **PART A**

1. Program to convert upper case into lower case and vice versa
2. Program to count the number of occurrences of a character in a string
3. Program to print the right most digit in a number.
4. Program to count the number of numerals upper case, lower case and special character in a given string.
5. Program to check whether a string is palindrome or not.
6. Program to find out the value of  $\sin(x)/\cos(x)$  using mathematical series
7. Program to print the transpose of a matrix.
8. Program to check whether a matrix is identity matrix or not
9. Program to find the product of two matrices.

#### **PART B**

10. Program to arrange numbers in ascending order
11. Program to arrange names in alphabetic order
12. Program to find the mean, median and standard deviation of numbers using functions.
13. Program to display first N terms of Fibonacci series using recursive functions
14. Program to find the roots of Quadratic equation using macros.
15. Program to demonstrate the use of Structures and Union.

- 16. Program to show the difference between Call by value and Call by reference
- 17. Program to demonstrate the use of Files.
- 18. Program to implement Bitwise operation.

Scheme for Practical Examinations:

- 1. Writing two programs (one from each part) : 10 marks
- 2. Execution of one program : 10 marks
- 3. Practical record : 05 marks
- 4. Viva Voce : 05 marks

Total : 30 marks

Note: i) Internal Assessment for each paper (Theory) : 10 marks

ii) Practical Examination of 2 Hours Duration : 30 marks

iii) Theory Examination of 2 Hours Duration : 60 marks

Total : 100marks

### B.Sc., QUESTION PAPER PATTERN I SEMESTER

Theory Paper carries 60 marks. The duration of the paper is 3 Hours.

Internal Assessment carries 10 marks and

Practical examination carries 30 marks and duration of practical examination is 3 hours.

Theory paper should consist of 3 Sections Max Marks: 60    Duration: 3 Hours

Section A : There Should be 12 questions and students should answer any 10 each carrying 1mark (1x10=10Marks)

Computer Fundamentals: 6 questions

Programming in C : 6 questions

Section B: There Should be 7 questions and students should answer any 5 each carrying 3 marks. (3x5=15 marks)

Computer Fundamentals : 3 questions

Programming in C : 4 questions

Section C : There should be 8 question and students should answer any 5 each carrying 7marks. (7x5=35 Marks)

Computer Fundamentals: 4 questions

Programming in C : 4 questions

## **CSHIT: Data Structures and Operating System**

Total teaching Hours/Semester:45

No of Hours/Week:04

### **1. DATA STRUCTURES (02)**

Introduction to data Structures

Definition Classification of data structures Operations on data structures Introduction to Time and Space complexity.

#### **Primitive Data Structures (02)**

Integer, Character, float, Strings memory representation and primitive operations String manipulation using pointers.

#### **Arrays (02)**

Storage Representation for 1D and 2D arrays, Insertion and deletion on 1D arrays advantages and disadvantages of arrays.

#### **Linked lists (02)**

Pointers Dynamic Memory Allocation Singly Linked lists. Operations of linked lists- Insertion and Deletion of a Node. Introduction to Circularly linked lists and Doubly linked lists.

#### **Stacks (05)**

Concepts, operations, sequential and linked implementation. Application of stacks ,towers of Hanoi-Infix to postfix conversion. Evolution of Postfix Expressions.

#### **Queues (05)**

Concepts, operations sequential and linked implementation, Circular queues

Priority queues and Dequeues (Introductory concepts) Application of queues.

**Trees** (05)

Definitions and concepts-Binary trees, Sequential and Linked Representation of Binary Trees  
Indention and Deletion on binary trees. Binary Tree Traversal.

**Graphs** (04)

Concepts, Sequential and Linked Representation of Graphs. BFS and DTS Traversal Wars  
hall's Shortest Path Algorithm

**Searching and Sorting** (05)

Linear and Binary search Selection sort Insertions sort Quick sort Merge sort

**II. OPERATING SYSTEM**

**Introduction to Operating Systems** (04)

What is an Operating System (OS)? History of OS Simple Batch Systems. Multi programmed  
Batched Systems. Time-Sharing Systems. Personal Computer Systems. Distributed Systems  
and Real-Time Systems. Operating System Structures –Command Interpreter System.  
Operating System Services. System Calls System Programs.

**Process Management** (06)

Process Concept Process Control Block, Process Scheduling CPU Scheduling-Basic  
Concepts. Scheduling Criteria Scheduling Algorithms-FIFO, RR, SJF, Multi-level, Multi-  
level fee back.

**Storage Management** (07)

Basic Concepts, Logical and Physical Address Space. Swapping Contiguous Allocation.  
Paging, Segmentation. Virtual Memory-Demand Paging, Page Replacement. Page  
Replacement Algorithms. Alienation of Frames. Thrashing and Demand Segmentation.

**File System** (05)

File Concept, Access Methods. Directory Structure, Protection File System Structure  
Allocation Methods Free-Space Management.

**I/O Systems** (03)

Overview of I/O Systems I/O Interface, Secondary Storage Structure- Disk Structure Disk  
scheduling.

**Text Book for Data Structures**

1. Tremblay J.P and Sorenson P.G An introduction to data structures with application  
2nd Edition.
2. Lipscholtz Seymour Data Structures Sham's series.

Text Book: for Operating Systems

1. Silberschatz, Abraham and Galvin, Peter Bach, Operating System Concepts  
5th Edition John Wiley and Sons.

## CSIIIP1: DATA STRUCTURES LAB

Total Practical Hours/Semester:45

No of Practical Hours/Week:03

1. Menu driven program to concatenate two string and find the length of a string using pointers.
2. Menu driven program to copy a string and extract fo substring using pointers.
3. Menu driven program to find GCD of two numbers and Factorial of given number.
4. Creation of linked list and insertion fo an element into it.
5. Creation of linked list and deletion of an item from it.
6. Implementation of Stack using pointers.
7. Implementation of Queues using Pointers.
8. Creation of Binary Tree and its Traversals.
9. Implementation of Quick Sort, insertion sort and selections sort.
10. Implementation of Binary search.

Scheme for Practical Examinations:

1. Writing two programs : 10marks
2. Execution of one program : 10 marks
3. Practical record : 05 marks
4. Viva Voce : 05 marks

Total : 30 marks

Note: i) Internal Assessment for each paper (Theory): 10 marks

ii) Practical Examination of 2 Hours Duration : 30 marks

iii) Theory Examination of 2 Hours Duration : 60 marks

Total : 100 marks





### III Semester Syllabus

#### CSIIT1 OOPS USING C++ AND DBMS

No. of Lecture Hrs/week 04

#### 1. OOPS AND C++

##### **Introduction to OOP and C++** (02)

Characteristics and benefits of OOPs, History of OOP, Structure of C++ program, Data types and operators, Statements of C++, tokens, Expressions and control structures, operators in C++.

##### **Input output objects** (01)

Usage of in and out objects, Comparison of studio h and isopteran h

##### **Control Structures** (02)

If, if-else, nested-if, switch, while, do-while, for, nested for, break and continue statements (use of conditional and logical operators).

##### **Arrays, Functions of structures** (04)

Array fundamentals, types, strings, C supported functions, prototyping, Inline functions, overloaded functions, functions with default arguments, storage classes, call-by-reference, return by reference, defining and using a structure.

##### **Objects and classes** (05)

Introduction-specifying a class-defining member function-nesting of member functions, arrays within a class, Arrays of objects, Objects as function arguments-Friend functions-pointer to members.

##### **Constructors, destructors and operator overloading** (05)

Constructors, types of constructors, copy constructor, overloading constructs, destructors, OPERATORS overloading (Unary and binary operators), data conversion.

##### **Inheritance** (05)

Extending Classes-defining derived classes-single, multilevel, multiple, hierarchical, and hybrid inheritance. Virtual base classes-Abstract classes-pointers Virtual functions and polymorphism-pointers to objects, this pointer.

**Files and streams** (02)

C++ streams, C++ stream classes-unformatted I-o operations –formatted I-O operations-managing O/P with manipulator-working with files-classes for file stream operations-opening and closing files-sequential I-O operations.

**2. DATA BASE MANAGEMENT SYSTEM**

**Introduction** (06)

Basic Concepts: Data, database, DBMS, Disadvantages of File oriented systems, Advantages of DBMS, database users, Database Languages, Characteristics of Database, Role of DBA, Data Abstraction (views) –Logical, Conceptual & Physical, Data independence- physical and logical independence.

**Data Models** (02)

Introduction of Data Models: E-R model, Relational model, network model and hierarchical model.

**RDBMS** (05)

Relational database concepts- attribute, tuple, types of attributes-single, multi-valued, stored, derived etc. keys-primary, index, candidate, alternate, foreign, Relationships, Relational algebra operations-UNION, INTERSECTION, DIFFERENCE, CARTESIAN PRODUCT, SELECTION, PROJECTION, JOIN, DIVISION, relational calculus, Domain, Domain integrity, Integrity rules-Entity integrity, referential integrity, Normalization and its properties (1st, 2nd and 3rd and BCNF)

**DDL and DML** (05)

DDL commands-create table/views/index, drop, alter, DML commands-select, insert, delete, update, etc., DCL commands- grant, revoke, commit, TCL commands, SQL-query, sub-query, nested query, Joins-natural, inner, outer join.

Database design and Distributed databases (01)

Design guidelines, overview of distributed databases

**CSIIIIP1 C++ LAB (PRACTICAL)**

No. OF PRACTICAL HRS/WEEK 03

**PART A** (Program related to C++ concepts)

1. Input the number of hours that an employee works and the employee wages and display the employees gross pay.
2. Find the largest and second largest of four numbers.
3. Check whether a given data is valid.
4. Find the GCD and LCM of two numbers
5. Find N C R Where  $nCr = \frac{n!}{(n-R)! * (R!)}$

6. Generate the Fibonacci series using arrays.
7. Interchange the values of two variables using reference variables.
8. Find the factorial of a number using function overloading
9. Find whether a given number is prime using functions overloading.
10. Calculate compound interest using default arguments Where  $CI = P * (1 + R/100)^T$ .
11. Check whether a given number is odd or even using inline functions.

**PART B** (Program related to OOPS concepts)

1. Write a program to create a database for a bank account containing Name, Account No, Account type and Balance include the following

a. Constructors b. Destructors C. Default constructors d. Input and Output functional and Input and Output for 5 people using different methods.

2. Create of class to hold information for a customer about his current-account and savings-account in a bank. Using friend functions find the total balance of both the account.

3. Write a program to overload the following operators.

b. Binary operator '+' to concatenate 2 strings and compare using

c. Relational operator '<' to find whether one date is less than other.

d. Find the next date of a given date using '++' operator

e. Find the next date of given date using '++' operator

f. Using '+', '-', '\*' to find the sum, difference and product of 2 complex numbers

4. Create a base class for a stack and implement push and pop operations, Include derived class to check for stack criteria's such as

a) stack is empty b) Stack is full

**B.Sc., QUESTION PAPER PATTERN III SEMESTER**

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Internal Assessment carries 10 marks and

Practical examination carries 30 marks and duration of practical examination is 3 hours.

Theory paper should consist of 3 Sections

Max Marks: 60 Duration: 3 Hours

Section A : There Should be 12 questions and students should answer any 10 each carrying 1mark . (1x10=10Marks)

Database Management System: 6 questions

OOPs and C++ : 6 questions

Section B: There Should be 7 questions and students should answer any 5 each carrying 3 marks. (3x5=15 marks)

Database Management System: 3 questions

OOPs and C++ : 4 questions

Section C : There should be 8 question and students should answer any 5 each carrying 7marks. (7x5=35 Marks)

Database Management System: 4 questions

OOPs and C++ : 4 questions

#### **IV Semester Syllabus**

#### **CSIVT1 SOFTWARE ENGINEERING AND VISUAL PROGRAMMING**

No. OF LECTURE HRS/WEEK 04

#### **1. SOFTWARE ENGINEERING**

**Software engineering and Project planning (05)**

Software characteristics, software components, Software process model; Classic life cycle model, prototyping model, spiral model. Planning software project: Defining the problem, developing solutions strategy, planning development process, planning activates.

**Software cost estimation (02)**

Cost factors, cost estimation techniques, staffing

**Software requirement definition (03)**

Software requirement specification, Formal specification techniques.

**Software design (04)**

Fundamental design concepts, modules and modularization criteria, design notations, design techniques. Object oriented design: components of object oriented design modules.

**Coding** (03)

Implementation issues, Structured coding, techniques, coding style, data abstraction, Verification and validation, reviews.

**Testing** (03)

Verification and validation techniques, Quality assurance, walkthrough and inspection, unit testing and debugging, system testing, formal verification.

**Software maintenance** (02)

Types of maintenance, Enhancing maintainability during development.

**2.VISUAL PROGRAMMING**

**Introduction** (03)

Introduction Features of Visual Basic, IDE, Writing small programs.

**Program Constructs** (06)

Variables, Constants, Operators, User defined data types, Arrays Functions, control statements, Input Box, Msg Box

**Controls** (04)

Intrinsic controls, common properties and importance.

**Control arrays and User defined procedures** (04)

Creation, general procedures and event procedure, creating and calling functions, scope of procedures.

**Handling Data access** (06)

Visual Data manager, Creating a data base, Data control, Data Access objects, RDO, ActiveX objects.

**CSIV1 DBMS MINI PROJECT (PRACTICAL)**

**NO. OF PRACTICAL HRS/WEEK 03**

The mini project is to introduce the student to the methodology for solving a problem and preparing a report using the steps of software engineering student should take a separate mini project and submit a dissertations.



## V Semester Syllabus

### CSV T 1 INTERNET TECHNOLOGY

NO. OF LECTURE HRS/WEEK 03

**INTERNET TECHNOLOGY** (35 HRS)

**Basic Internet Concept** (05)

History, components, Security, Protocols, Internet addressing, DNS and directory services.

**Internet applications** (05)

Electronic mail, News groups, UUCP, FTP and Telnet.

**World Wide Web** (08)

Overview, Hyper Text Markup Language, Uniform Resource Locator, HTTP, Common Gateway Interface, Multipurpose internet mail extensions, web browsers, search engines.

**HTML** (15)

Introductions Lists in HTML, Ordered and Un ordered lists, Directory lists, Hyperlinks, HTML tables, Frames, HTML forms.

Recent Development in Information Technology.

### CSV P1 Internet lab

Total Practical hours/week 3hrs

1. Write HTML code to display your name, register number, class and college commenting on the date of creation.
2. Write a few lines about your college including the title as "My College"
  - a) Use appropriate text formatting options.
  - b) Make the name of the college to scroll from the left to the right at the bottom.
  - c) Use appropriate for ground and background color representation.
3. Display information about yourself
  - a) Use unordered lists to display your hobbies.
  - b) Use definition lists to display certain events.
  - c) Use ordered lists to display your subject of interest  
(Include appropriate titles and formatting features)
4. Create an HTML document to display a picture of your choice and write a few lines about it.
5. Write a few lines about your country with a background sound, which repeats 7 times. Also include suitable images in it.
6. Create a HTML document to display the courses available in your college. Each course should be linked to another HTML document, which provides information about the course.

7. Create an image link displaying a product. The link should provide information about the product.
8. Create a list providing information about three web sites; link each item on the list to the web sites.
9. Create a table to display your class timetable. Use your choice of background color, table color, etc., Use appropriate cell spacing, cell padding and cell width.
10. Create a table denoting your family tree. Include pictures at appropriate positions.
11. Display a list of three products in a frame. Link each one to display information about the product in the second frame.
12. Create an application form, which asks for information to admit the student to the college.  
The information can include

Name:

Fathers Name:

Address:

Age:

Date of Birth:

College last studied:

List of marks:

Add “Accept” and “Reject” buttons at the end.

## **CSVT2 JAVA PROGRAMMING AND UNIX/LINUX OPERATING SYSTEM**

NO. OF LECTURE HRS/WEEK 03

### **1. JAVA PROGRAMMING**

#### **Introduction (03)**

Features of Java, Data Types, Variable, Operators. Java Programming structure, Arrays-One Dimensional array, Two Dimensional array, Control Structure:- if statement, switch statement, while statement, do-while statement, for loop, continue and break statement, Access specifier public, private.

#### **Class and Objects (04)**

Class fundamentals, declaring objects, Access modifiers – final, static, abstract, native, volatile, synchronized Introduction to methods, constructors, command line arguments. Inheritance-Single or simple inheritance, Multi level inheritance. Using SUPER, abstract and final key word with inheritance.



## **Packages and Interfaces**

(06)

Packages-define package, CLASS PATH, access protection, importing packages.  
Interface-define interface, implementing interface, variables in interface. Lang-  
Package:- Wrapper classes. Until-packages:- Date, Calendar, Random, 10-packages:-  
File input stream and output stream.

## **Exception Handling and Multi Threading Exceptions**

(05)

Fundamentals of exception, Exception types, using try & catch, multiple catch, nested try, throw, finally, built-in exception, user defined exceptions. Multithreading: -  
Thread fundamentals, priorities, Creating thread using Thread class and Run able interface.

## **2. UNIX/LINUX OPERATING SYSTEM**

### **Introduction**

(03)

History, features, architecture, File System: Boot Block, super block, Inode table, data block, storing & accessing files, directory & file related commands.

### **Special tools utilities**

(03)

Filters process, piped process, process control, FOR, EXIT, WAIT & EXEC commands, Unix system calls & library functions.

### **System administration**

(03)

User & supervisor privileges & facilities Controlling processes accessing the file system, security issues, secondary storage management.

### **Shell Programming**

(08)

C shells-shell variables, parameter shell commands, if, while until, for, break, & continue, simple programs. Unix system communication: Introduction, write, read, wall commands.

## **CSVP2 JAVA PROGRAMMING AND UNIX/LINUX OPERATING SYSTEM LAB (PRACTICAL)**

NO. OF PRACTICAL HRS/WEEK 03

### **Java Programming Lab**

2. Write a Java program to check whether two strings are equal or not.
3. Reverse a string
4. Write a Java program to find the sum of digits of given number
5. Write a Java Program to display multiplication table
6. Write a Java program to generate prime numbers between a range.

7. Write a Java program to sort an array
8. Write a Java program to create object of tree Set and Stack and Use all methods
9. Write a Java program to check all math class functions.

### **LINUX/UNIX operating system lab**

1. To conversant with system administration functions
2. To conversant with system commands
3. Write a shell program to count the number of characters in a given string.
4. Write a shell program to count the numbers of vowels.
5. Write a shell program to find whether given year is leap year or not.
6. Write a shell program to check whether given string is palindrome or not.
7. Write a shell program to display all the files in a current directory.
8. Write a shell program to find the factorial of a given number
9. Write a shell program to print a string in a reverse order.

Total Teaching Hours/Semester:60

No of Lecture Hours/Week :04

### **B.Sc., QUESTION PAPER PATTERN IV SEMESTER**

Theory Paper carries 60 marks. The duration of the paper is 3 Hours.

Internal Assessment carries 10 marks and

Practical examination carries 30 marks and duration of practical examination is 3 hours.

Theory paper should consist of 3 Sections

Max Marks: 60 Duration: 3 Hours

Section A : There Should be 12 questions and students should answer any 10 each carrying 1mark . (1x10=10Marks)

Linux / Unix : 6 questions

Java Programming : 6 questions

Section B: There Should be 7 questions and students should answer any 5 each carrying 3 marks. (3x5=15 marks)

Linux / Unix: 3 questions

Java Programming: 4 questions

Section C : There should be 8 question and students should answer any 5 each carrying 7marks. (7x5=35 Marks)

Linux / Unix: 4 questions

Java Programming: 4 questions

## VI Semester Syllabus

### 1. INTERACTIVE COMPUTER GRAPHICS

Unit 1: **Interactive Computer Graphics**-How the Modern Interactive Display works, Raster Graphics and Random Graphics, Display Devices -CRT-Color CRT. Display Controller. (04)

Unit 2: **Graphics Primitives**- Lines and Line Drawing Algorithms-DDA and Bresenham's Circle Drawing Algorithms-DDA and Midpoint, Polygons and Area Filling-Scan Line Algorithm. (06)

Unit 3: **Geometric Transformations**-Translation, Rotation, Scaling, Homogeneous Coordinates, Composite Transformations, Reflection, Shear. (04)

Unit 4: **Window and View port**-Windowing Transformation (Mathematical Expression), Clipping, Line Clipping-Cohen-Sutherland Algorithm, Polygon Clipping-Sutherland-Hodgeman Clipping Algorithm. (06)

Unit 5: **Three Dimensional Graphics**- 3 D Co-ordinate Systems, 3 D Display Techniques, Parallel Projection and Perspective Projection, Three Dimensional Transformations, Polygons and Polygon Tables, Curves-Splines and Bezier Curves. Sweep Representations, Constructive Solid Geometry methods, Cortes, Fractals. (100)

Book for Reference

1. Hearn, Donald P., Baker, Pauline M. Computer Graphics using C. 2<sup>nd</sup> Edition. Pearson Education.
2. Harrington, Steven. Computer Graphics-A Programming Approach 2<sup>nd</sup> Edition. McGraw-Hill International Editions.
3. Sproull, R.F., Newman, W.M. Interactive Computer Graphics. 2<sup>nd</sup> Edition. Tata-McGraw Hill Publishing.

### II. MULTIMEDIA TECHNOLOGY

Unit 1- **Multimedia Information Representation**: Introduction, Digitization Principles- Analog Signals, Encoder Design, Decoder Design. (02)

Unit 2- **Discrete Media**: Text-Unformatted Text, Formatted Text, Hyper Text. Images- Graphics. Digitized Documents, Digitized Pictures. (04)

Unit 3- **Continuous Media:** Audio-PCM Speech. CD-Quality Audio, Synthesized Audio. Sound Fundamentals-Computer Representation of Sound. Music-MIDI Format and Fundamentals. Video-Broadcast Television. Digital Video, PC Video, Video Content. (09)

Unit 4- **Text Representation and Compression:** Generation and Representation of Text, Compression Principles-Source Encoder and Destination Decoder, Lossless and Lossy Compression, Entropy Encoding, Source Encoding Text Compression-Static and Dynamic Huffman Coding, Arithmetic Coding. (07)

Unit 5- **Image Storage and Compression:** Vector Graphics and Bitmapped Images, Images Format, Graphics Interchange Format (GIF), Tagged Image File Format (TIFF), Digitized Documents, JPEG-Lossy and Lossless. (09)

Unit 6- **Audio Representation and Compression:** Audio Basics, Differential Pulse Coded Modulation (DPCM), Adaptive Differential PCM (ADPCM), Adaptive Predictive Coding and Linear Predictive Coding, MPEG Audio Coding. (07)

Unit 7- **Video Representation and Compression:** Principles, Digitizing Video, Streaming Video, Combining Audio and Picture, H.261 Video Compression, MPEG 1, MPEG 2 and MPEG 4.(07)

Book for Reference

1. Halshall, Fred. Multimedia Communications-Applications, Networks, Protocols and Standards. 2001. Pearson Education.
2. Chapman, Nigel and Chapman, Jenny Digital Multimedia. 2000. John Wiley & Sons.
3. Steinmaetz, Ralf and Nahrstedt, Klara, Multimedia. Communication and Applications 2003 Pearson Education.

CSVPI PROJECT LAB (PRACTICAL)

Total Practical hours/week 06

Students are required to take up a problem and develop a system by making use of the existing infrastructure (S/w and H/w) available in their respective colleges. Students should collect the requirements and work in the allotted lab hours in the college only.

## **Fourth Semester**

### **Paper 4.6 COMPUTER FUNDAMENTALS**

(Common to B.A. and B.Sc., Courses, except for the B.Sc., students with Computer Science as optional subject)

Unit 1: General features of a computer. Generation of computers. Personal computer, Workstation, mainframe computer and super computers. Computer applications-data processing, information processing, commercial, office automation, industry and engineering, healthcare, education, graphics and multimedia.

(8 h)

Unit 2: Computer organization Central processing unit. Computer memory-primary memory and secondary memory. Secondary storage devices-magnetic and optical media. Input and output units. OMR, OCR, MICR, scanner, mouse, Modem.

(10 h)

Unit 3: Computer hardware and software. Machine language and high level language. Application software. Computer program. Operating system Computer virus, antivirus and computer security. Elements of MS. DOS and Windows OS. Computer arithmetic. Binary, octal and hexadecimal number systems. Algorithm and Flowcharts, Illustrations. Elements of a database and its applications. (12

h)

Unit 4: Word processing and electronic spread sheet. An overview of MS. WORD, MS.EXCEL and MS. POWERPOINT. Elements of BASIC programming, Simple illustrations. (10 h)

Unit 5: Network of computers Types of networks, LAN, Intranet and Internet, Internet applications, World wide web, E-mail, browsing and searching, Search engines, Multimedia applications. (10h)

Total : 50 hours

List of Practical Assignments: (12 Sessions of 2 hours each)

1. System use, keyboard, mouse operations. Word pad and paint brush. Creating a folder and saving a document-Two sessions
2. Simple MS.DOS commands-One session
3. Windows operating system-icons, menus and submenus, my computer. Two Sessions.
4. Desktop publishing-preparation of a document using MS.WORD Two sessions
5. Installation of software, virus scanning-illustrations. One session.
6. Spreadsheet calculations using MS.EXCEL One session.
7. BASIC programming-illustrations.-One session.
8. Internet use. Surfing, browsing, search engines, E-mail. Two sessions.

List of Books for study and reference:

1. Alexis Leon and Mathews Leon (1999): Fundamentals of Information technology, Leon Techworld Pub.
2. Jain, S.K (1999): Information Technology “O” level made simple. BPB Pub.
3. Jain V.K. (200) “O” Level Personal Computer software, BPB Pub.
4. Rajaraman, V. (1999): Fundamentals of Computers. Prentice Hall India.
5. Hamacher, Computer Organization. McGrawhill.
6. Alexis Leon: Computers for everyone. Vikas, UBS.
7. Anil Madaan; Illustrated Computer Encyclopedia, Dreamland Pub.

8. Sinha Computer Fundamentals, BPB Pub.