

## COMPUTER GRAPHICS

L	T	P
3	1	4

### Rationale

This subject will enable the students to have awareness about fundamental graphics which can be generated through computer using programming language c. They will be able to make pictures and introduce motion in them using basic transformations.

### Detailed contents

1. **Overview of Graphics systems**  
Raster scan displays, Vector scan displays, Colour CRT monitors, and Flat panel display, input and output devices.
2. **Output primitives**
  - Line drawing algorithms – DDA Algorithm and Bresenham's algorithm
  - Circle generating algorithms – Circle algorithm, midpoint circle algorithm
  - Introduction to Region filling, flood filling and boundary filling
3. **Graphics primitives in C**
4. **Two dimensional transformations**
  - Basic transformation – Translation, Rotation, Scaling
  - Matrix representation & homogenous coordinates, Composite transformations – translation, Rotation, Scaling
  - Other transformations – Shear and Reflection
5. **Viewing and Clipping**
  - Window to view port coordinate transformation
  - Point clipping, Cohen-Sutherland line clipping algorithm
  - Sutherland Hodgeman polygon clipping
6. **Three-Dimensional Graphics**  
Three dimensional transformations, Introduction to wire-frame model, Bezier curves.
7. **Projections**
  - Parallel projections
  - Perspective projections
8. **Animation**
  - Conventional and computer animation
  - Design of animation sequences
  - Morphing
  - Kinematics and dynamics



1. Programming using graphic primitives in C
2. Line drawing using DDA algorithm
3. Line drawing using Bresenham algorithm
4. Bresenham's circle algorithm
5. 2D translation technique
6. 2D rotation technique
7. 2D scaling technique
8. Creating animations

#### Reference Books

- |  |   |                   |
|--|---|-------------------|
| 1. Computer Graphics                           | - | Hearn Baker       |
| 2. Computer Graphics                           | - | Schaum Series     |
| 3. Computer Graphics programming approach      | - | Steven Harrington |
| 4. Principles of Interactive computer graphics | - | Newman and Sproul |



## SOFTWARE ENGINEERING

L	T	P
3	1	3

### RATIONALE

This subject will enable the diploma students to have awareness about software engineering, various matrices, planning about software, cost estimation, software design etc.

### Detailed Contents

1. **Introduction to Software (S/W) Engineering**  
Introduction, size factors, Quality and productivity factors, Management issues, models and waterfall, spiral, prototyping, fourth generation techniques, software process.
2. **Software Matrices Engineering**  
Size, function, design, oriented matrices, halstead software science Mcate complexity.
3. **Planning**  
The development process, an organizational structure, other planning activities, Data flow diagram
4. **Software Cost Estimations**  
Cost factors, cost estimations techniques, Staffing level estimation, estimating software, maintenance costs, COCOMO
5. **Software Requirement Definition**  
Problem analysis, requirement engineering. The Software Requirements Specifications (SRS), formal specifications techniques, characteristics of a good SRS.
6. **Software Design and Implementation Issue**  
Fundamental design, concept design notations, design techniques, structured coding, techniques coding styles, documentation guidelines.
7. **Verification and Validation Techniques**  
Quality assurance work through and inspections static analysis, symbolic execution unit testing, formal verifications. Black box and white box testing techniques.
8. **Maintenance Overview**  
Configuration Management

### REFERENCE BOOKS

1. An Integrated Approach to Software Engineering - Pankaj Jalote, Narosa Publishing House Pvt Ltd, Darya Ganj, New Delhi-110002
2. Software Engineering - A Practitioner's Approach - RS Pressman, Tata McGraw Hill Publishers, New Delhi
3. Software Engineering - K K Aggarwal and Yogesh Singh



## ADVANCED COMPUTER SYSTEM ARCHITECTURE

L	T	P
3	1	6

### Rationale

The student will get familiar with different type of motherboard, architecture and bus standards. The single user system base on 486, Pentium MMX, Pentium-II, Pentium-III and Pentium -IV will get emphasis

### Detailed Contents

1. Salient features and block diagram - 486, Pentium -MMX, P-II, P-III and P-IV
2. Bus standards: ISA, EISA, VESA & PCI.
3. Interface standards: RS 232C, SCSI-II, Fast & wide SCSI, IEEE 488.
4. Detailed Architecture: 486, P-MMX, P-II, P-III, P-IV.
5. Introduction to RISC processor based computer systems (Power PC).
6. Parallel Processing: Pipeline Computing-Classification of pipeline processor, array processor-SMID processor and their inter connection networks
7. Multiprocessor systems: Loosely coupled multiprocessor, tightly coupled multi processor and their interconnection networks
8. Introduction to IRIX Architecture: IRIX root directory, important IRIX system files, IRIX commands configuring user accounts, IRIX login shell, disk drive supported by IRIX, system Disk, Option disk, and partition layout, IRIX file system, IRIX networking
9. AS/400: Salient features, Block diagram, Architecture of AS/400
10. Comparison of Pentium PC and Laptop motherboard

### LIST OF PRACTICAL

1. Study of the mother boards of 486 & Pentium processors.
2. Identification of chipsets and functional aspects of different subsystems on each card.
3. Study of the bus system and identifying various signal lines.
4. Study of peripherals used their speeds & capacities & study of Integration of the peripherals into the systems.
5. Practical based on AS/400.
  - Operations and procedure
  - Log on, Log off, shutdown
  - Jobs and subsystems(Interactive, Batch, Autostart, Spooling).
  - Backup and Restores.
  - Terminals and user to the system.
  - Creating multiple AS/400 sessions.
  - Basic objects and library concepts.
  - AS/400 naming conventions.



- CL commands.
- Introduction CL programming

6. Practical based on silicon graphics
  - Creating a login account
  - Practical based on IRIX command-  
pwd, cd, ls, dirview, mkdir, cp, ln, mv, rm, rn-  
r, rmdir, lp, lpstat, chmod, man, man-t
  - Adding user account using shell command
  - Configuring for a network

#### Reference Books

1. Govind Raju: IBM PC and Clones.
2. Raffiquzzman: Computer Architecture.
3. Fairhead : 80386/80486-BPB publication.
4. Computer Architecture and parallel processing-Kai Hwang, Faye B Briggs



# MULTIMEDIA APPLICATIONS

L	T	P
3	1	6

## RATIONALE

Multimedia technology is being widely used in web pages, motion pictures and interactive presentations, animations etc. This course intends to introduce and expose multimedia technology and various factors and features of authoring software. It will also help in making the internet application richer in content and presentation

## DETAILED CONTENTS

1. Introduction To Multimedia
  - Need of Multimedia
  - Application of Multimedia
  - Multimedia Hardware
  - Storage for Multimedia
2. Sound
  - MIDI Versus Digital Audio
  - Audio Compression
  - Capturing Sound
3. Video
  - Video Application
  - Video Capturing
  - Video Compression
4. Multimedia Authoring Tools
  - Card Based Authoring Tools
  - Icon Based Authoring Tools
  - Time Based Authoring Tools
5. Text
  - Fonts and Faces
  - Font Manage
  - Hypertext
6. Images
  - Image File Format
  - Bitmaps
  - Vector Drawing
  - Image Capture Using MATLAB
  - Image Compression
7. Animation
  - Principle of Animation
  - Animation File Formats
  - Making Animation that Works

## List of Practical

1. Familiarization With Multimedia Software And Hardware
2. Exercise On
  - Various Features Of Author Ware
  - Various Features Of Director



- various Features Of Flash
- Various Features Of Photoshop
- 3. Making Multimedia Presentation Using Various Multimedia Tools
- 4. Installing and use of various multimedia Devices
  - Scanner
  - Digital Camera, Web Camera
  - Mike And Speakers
  - Touch Screen
  - Plotters And Printers
  - DVD
  - Audio CD and Video CD
- 5. Reading And Writing Of Different Format On A Frame CD
  - Transporting Audio And Video Files
- 6. Making Multimedia Presentations Combining Director, Flash, and Photoshop such as Department Profile, Lesson Presentation, Games and Project Presentation.

#### **Reference Books**

1. Multimedia In Practice
  2. Multimedia Making It Works - Tay Vaughan
- Judith Jeffeoate



# NETWORK SECURITY

L T P  
3 1 6

## RATIONALE

This course has been designed by keeping in you the basic computer user and information system manager. The concept needed to read through the ripe in the market place and understanding risks and how to deal with them. It is hope that the student will have a wider prospective on security in general and better understanding of how to reduce and manage the security risks.

## DETAILED CONTENTS

1. Introduction  
Why secure network- Attackers Vs Hackers; attack from within and external.
2. How much security  
Promoting risk analysis; developing security policy - accessibility; defining security goals, justifying the policy, roles and responsibility; consequences of non-compliance, level of privacy.
3. Firewalls  
Defining an excess control policy; definition of firewalls and types, Firewalls (UNIX and NT), address translation, firewall logging, firewall development.
4. Intrusion Detection System (IDS)  
IDS introduction; IDS limitation - teardrop attacks, counter measures; Host based IDS setup.
5. Authentication and Encryption Authentication  
Clear Text transmission, session tracking; Encryption - Methods, weaknesses, government interaction; Solutions - data Encryption standards, digital certificate servers, IP security, point to point tunnelling protocol (PPTP), RSA encryption, secure socket layer (SSL), secure shell, simple key management for IP(SKIP).
6. Visual Private Network (VPN)  
Basics setting of VPN - proposing with firewalls, VPN diagram, configuration of required objects, exchanging keys, Modifying security policy
7. Virus, Trojans and Worms  
What is virus: replication, concealment, bomb, social engineering viruses; Worms: Trojan horses, preventive measures - access central, checksum Verification, process neutering, virus scanners, heuristic scanners, Application level virus scanner, deploying virus protection
8. Disaster, Prevention and Recovery  
Disaster categories; network disaster - cabling, topology, single point of failure, save configuration file; server disasters - UPS, RAID, Clustering, Backups, server recovery, reluctant servers.



## **LIST OF PRACTICALS**

1. Installation of Anti - virus Package.
2. Checking and removal of virus from the system.
3. Study of firewall.
4. Study of Encryption, Decryption and Security Measures.
5. Visit to higher organisation for the demonstration about Network Security and exposure to software available.
6. Implementation of Security algorithm.

## **REFERENCE BOOKS**

1. Mastering Network security- Christ Breton; BPB Publication, New Delhi
2. Web- sites - Christ Breton; BPB Publication, New Delhi
3. Network firewalls - Kiranjeet Syan; New Rider Publication
4. Internet Security- New Rider Publication



## MAJOR PROJECT

The three months of the sixth semester shall be utilized by the students in in-house/industrial training working on major project. Major project work is meant for solving live problems faced by computer and electronics industries by applying the knowledge and skills gained through the diploma course in computer engineering. The institutes offering the course will identify live problems pertaining to computer industries. The activity of problem identification should begin well in advance (say in the beginning of sixth semester). Students should be allotted a problem of interest to him/her as a major project work. For solving one problem there should not be more than two students in a group. The students will execute the project work under the guidance of teachers. Each teacher would not have more than 6 students for guiding major project work.

The students will be given major project assignment for a period of 3 months at a stretch during the final semester. During this project period concerned teacher will monitor the progress of students by paying regular visits to the industry. The students will submit a comprehensive project report (in a presentable manner, preferably typed and bound) for evaluation by the teacher guide, an expert from industry and an external examiner.

Some of the project activities are given below:

- Installation of computer systems, peripherals and Software
- Programming customer based applications
- Web page designing
- Database applications
- Networking
- Software development
- Fabrication of components/equipment
- Fault-diagnosis and rectification of computer systems and peripherals
- Bringing improvements in the existing systems/equipment