GURU NANAK DEV INSTITUTE OF TECHNOLOGY
CURRICULUM FOR DIPLOMA COURSE

IN

COMPUTER ENGINEERING

THIRD YEAR

(TERM V & TERM VI)

FOR

DELHI STATE

GOVT. OF DELHI

GURU NANAK DEV INSTITUTE OF TECHNOLOGY
ROHINI, SECTOR-15, DELHI

TERM-V

S.NO	SUBJECT	LTP	EVALUATION SCHEME						TOTAL MARKS
			INTERNAL ASSESSMENT		EXTERNAL ASSESSMENT				
			THEORY	PRACTICAL	WRITTEN MARKS	HOURS	PRACTICALS	HOURS	
1	Computer Troubleshooting & Maintenance	4 1 3	50	50	100	3	50	3	250
2	Computer Network	4 1 4	50	50	100	3	50	3	250
3	Programming in Java	4 1 4	50	50	100	3	50	3	250
4	Entrepreneurship Development & management	3 1 -	50	-	100	3	-	-	150
5	Computer Workshop-III	- - 6	-	50	-	-	100	-	150
	Student Centred Activities	4							
		15 4 21	200	200	400		250		1050

TERM-VI

S.NO	SUBJECT	LTP	EVALUATION SCHEME						TOTAL MARKS
			INTERNAL ASSESSMENT		EXTERNAL ASSESSMENT				
			THEORY	PRACTICAL	WRITTEN MARKS	HOURS	PRACTICALS	HOURS	
1	Computer Graphics	3 1 6	50	50	100	3	50	3	250
2	Elective 2.1 Software Engineering 2.2 Advanced Computer Architecture 2.3 Multimedia Application 2.4 Network Security	3 1 6	50	50	100	3	50	3	250
3	Seminar	- - 16	-	50	-	-	-	-	50
4	Project			200	-	-	250	-	450
	Student Centred Activities	- - 4							
		6 2 32	100	350	200		350		1000

COMPUTER ENGINEERING
DETAILED CONTENTS
OF
VARIOUS SUBJECTS
THIRD YEAR

COMPUTER TROUBLESHOOTING & MAINTENANCE

Rationale

This subject gives the knowledge and competency to diagnose the faults for trouble shooting for systematic repair and maintenance of computer and its peripherals

Detailed Contents

1. Concept of servicing & maintenance

Reliability of electronic equipment MTBF, M**T**TR availability of an equipment .Preventive maintenance & need of preventive maintenance. Factors affecting the performance of computer. Preparation of preventive maintenance schedule. Preventive maintenance requirement of a subsystem & auxiliary sub system.

2. Breakdown maintenance:

Scope of field servicing, analysis of customer call reports in locating faults. .

3. fault location & its identification:

Various methods of locating fault like visual inspection, layman checks, diagnostic software, error logging & its use. Symptoms & remedies for common faults in peripherals like printers, monitors, FDD, HDD mouse & associated interfaces of PC based systems.

4 Symptoms & remedies

for common faults in peripherals like printers, monitors FDD, HDD**,** Mouse Motherboard and Supporting cards.

5. Power supply

-Linear power supply & switch mode power supply. Significance of power good signal, block diagram.& trouble shooting of switch mode power supply.

6. Viruses,

their types of detection / prevention / removal using vaccines. Familiarization with PC tools & Norton Utilities & their applications.

LIST OF PRACTICAL

1. Running diagnostics.
2. Assembling & disassembling of computer systems.
3. Virus detection & elimination.
4. Troubleshooting and maintenance

=Monitor
=FDD
=HDD
=Printers
=Mouse
=Keyboard
=CDROM/DVD
=SMPS

Computer Networks

Rationale

Rationale

The future of computer technology in computer networks. Global connectivity can be achieves through computer networks.

Detailed Contents

Detailed Contents

1. Introduction

1. Introduction

Network needs & goals, Application of networks, network topologies, need of protocols, protocol and interfaces, networks services and service access points.

2. OSI reference model, TCP/IP reference model, Comparison between OSI & TCP/IP reference model

3. Transmission media - analog transmission media, digital transmission media, switching techniques.

4. Data link layer - functions, protocols - stop & wait, sliding window.

5. IEEE standards - 802.3, 802.4, 802.5 fast Ethernet, FDDI, fiber Optics.

6. Network Layer - functions, routing algorithms, Inter-neworking. Familiarizaton with repeater, hubs switch bridge, routers, and gateways.

7. Transport Layer - Functions and services, transport service primitive, sockets, elements of transport protocols, UDP

8. Broad Band network - ISDN, ATM, Introduction to VSAT, ADSL.

9. Network security - Levels of security, introduction to cryptography, Data Encryption Standard (DES) public key cryptography, firewalls.

List of Practical

List of Practical

1. Identification of various network components
=Connections, BNC, RJ-45, I/O Box, Rosette box, Crimping tools.
=Cables,Co-axial, twisted parr, UTP, fiber Optics.
=NIC(Network interface card)
=Switch,Hib, Router,.

2. Sketch wiring diagram of network considering a computer lab of 20 systems
3. Interfacing with the network card (Ethernet)
4. Preparing of network cables-cross cables, straight cables
5. Use of protocols in establishing LAN viz TCPIIP, NETBUI.
6. Installation of networks (Peer to Peer networking client sever interconnection)
7. Use/Installation of Proxy server
8. Trouble shooting networks

Reference Books

Reference Books

1. Data communication networks-A. Forouzan
2. Computer Networks -Tannenbaum
3. Computer Network and Distributed processing-James Martin
4. Computer communication network (ISTE)-A. Shanmugam, S. Rajeev)

PROGRAMMING IN JAVA

1. Introduction to Java

The Basics of Java-A brief history of Java, The Java, Architecture, Java Features. Importance of Java to the Internet Java Applets and Applications, Fundamentals of Object Oriented Programming, Concepts of OOP, Benefits of OOP, Java and C++, Java Environment, Java Development Kit, Application programming Interface (API). Getting started with JDK, Java program structure, Using Java with Other Tools

2. Language Basics

Java tokens, Java character set, Keywords, Identifiers, Literals, Separators . Constant Variables. Data types. Type casting Constants, Variables and their Scope, Operator and Expressions, Arithmetic Operators, Relational & Conditional Operators, Logical Operators:, Assignment Operators, Increment & Decrement Bitwise operator, special Operators, Precedence of Operators, Control Flow statements If & If else statements, switch Statement, for loop, while do loop, Branching.

3. Objects and Classes in Java

Introduction to classes, Defining a class. Creating objects, Methods, Constructors and Access Specifiers Application of Constructor. Parameterized Constructors, Overloading Methods and Constructors, Access control Modifiers Public, Private and Protected. Static. Final and Abstract Modifiers and Method overriding, Inheritance basics, Method overriding

4. Arrays Strings and Vectors

Arrays one-dimensional array Multidimensional array, Strings, String class, Working with Strings, String Buffer class, Vector and wrapper class, Vector Constructors, Working with vector methods, wropper Class.

5. Packages and Interfaces

Using Java interfaces, Defining an interface, Implementing an interface, Extending an Interface, Using Java Packages, Defining a Package , Brief discussion on CLASSPATH, Access Protection, Importing a package, Java API Package,

6. Exception handling

Introduction to Exception Handling, why use Exception Handling, Fundamentals of Exception Handling. Exceptions & their types, Common Exceptions, Using Exception Handling using try and catch, Multiple Catch Statement, Nested try Statements, Methods available to Exceptions, Throwing your own Exception.

7. Applet programming

Writing Applets, The Basics of Applets, Life Cycle of an Applet, Painting the Applet, The Applet Tag, Security Restrictions when using Applets. Taking, Advantage of the Applet API, Finding and Loading data Files, Displaying short Status Strings, Displaying Documents in the Browser Playing Sounds Defining and Using Applet Parameters

8. Working with Graphics

The Graphic class, Java. Awt graphics, use of class, java. Awt. Graphics, Custom painting, Drawing Lines, Drawing Rectangles Drawing ellipses and circles, Drawing Arcs, Drawing Polygons, Practice : Ex Based on above concepts.

Reference Books:-

1. Programming in Java - Dr. Amita Dev, ISTF - Publications.
2. Mastering Java - John Zukowski
3. Programming in Java - E. Bala Guruswamy
4. The complete Reference Java - Herbert Schildt.

ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT

RATIONALE

creating awareness regarding entrepreneurial traits entrepreneurial support system opportunity identification project report preparation & understanding of legal & managerial can be helpful in motivating technical student to start their own small scale business/enterprise.

DETAILED CONTENTS

(1) Entrepreneurship
* Concept / meaning
* Need
* Competencies / qualities of an enterpreneur

(2) Entrepreneurial Support System
* District industry centers (DICs)
* Commercial banks
* Stale Financial Corporation
* Small industries Service institutes (SISIs) Small industries development bank of India (SIDBI), National bank of agriculture and rural development (NABARD), National Small industries corporation (NSIC) and other relevant institution/organizations at state level.

(3) Market survey and opportunity identification (business planning)
* How to start a small scale industry.
* Procedure for registration of small scale Industry.
* List of items reserved of exclusive manufacture in small scale industry
* Assessment of demand and supply in potential areas of growth.
* Understanding Business Opportunity
* Consideration in product selection.
* Data collection for setting tip small ventures.

(4) Project Report Preparation
* Preliminary project Report
* Techno-Economic feasibility report
* Project Viability

(5) Business Organizations
* Salient feature of sale proprietary ship
* Partnership private and public limited companies
* Cooperative societies and and public sector
* Role of public and private sectors in growth of economy and their social obligations towards society
* Monopoly and price Restrictions.

(6) Managerial aspects of small business
* Principles of management (definition, functions of management viz. planning, organization, coordination and control)
* Operational aspects of production.
* Inventory management
* Basic principles of financial management.
* Marketing techniques.
* Personnel management.
* Importance of communication in business.

(7) Legal aspects of small business

* Elementary knowledge of income tax, sales tax patent rules, excise duty. * Factory act and payment of wages act.

(8) Environmental Considerations

* Concept of ecology & environment
* Factors contributing to air, water, Noise pollution
* Air, Water & noise pollution standards & control

(9) Industrial Safety and House Keeping

* Magnitude and cost of accident
* Causes of accidents
* Job safety analysis
* Safety planning and its implementation safety education instruction and visual aids.
* Obligatory provisions
* First aid Investigations
* Investigation of accidents
* Fire fighting, BIS. Standards
* Security watch and ward.

(10) Miscellaneous

* Human relations & performance in organization
* Industrial relation & Disputes
* Relations with subordinates, peers & superiors
* Leadership
* Labour Welfare
* Workers participation in management

(11) Motivation

* Factors determining motivation
* Characteristics of motivation
* Methods of improving Motivation
* Incentives - pay, promotion, rewards

REFERENCE BOOKS

1. A handbook of Entrenpurship-BS Rathore and Dr. J.S. Saini
2. Environmental Development by CB Gupta and P. Srinivasan
3. Environmental and pollution awareness Sharma BR
4. Total quality management-Dr. D.D. Sharma

COMPUTER WORKSHOP - III

Rationale

This course will enable the student to understand the basic of internet and various applications of internet like e-mail, FTP, Telnet, Newsgroups and video conferencing. In adding this course develops competency amongst the student to design professional with sites and interactive web pages.

Net is an upcoming technology so the teacher should take pain in making the students conversant with this. The demonstration should be given using. Net software for describing the various features of NET Technology.

DETAILED CONTENTS

1. Developing Portals using HTML
Basic structure of HTML, designing a web page, inserting links images, horizontal rules, comments.
Formatting text, title, heading colors, fonts, sizes, simple table and forms.
HTML tags, hyperlinks, Adding graphics and images, image maps, images
files. Using tables, forms, style sheets and frames and DHTML

2. Using Front Page
Front page editor, Front explore

3. NET - evolution
Need and prospective in current scenario, NET framework over view Structural diagram

4. NET framework Base classes
User and Program interface, windows forms, console applications

5. XML
An overview of XML, use XML, integrity of XML with database, XML as the NET Meta languages

6. Visual Studio NET
Common IDE for all language, the common language specification all. NET languages, management of multiple language projects.

7. Language change
Visual basic C++, C#, overview of C# data types in C#, control flow in C#, C# classes

LIST OF PRACTICALS

1. Installing of NET
2. Exploring the various features of NET
3. Ability to work and start various tasks and features of NET framework
4. Able to work and develop program in Visual basic NET
5. To explore in detail Visual studio NET
6. Exercise based on HTML, DHTML & XML
- Creating Web pages using HTML
- Creating web pages using front page
- Demonstration of e-commerce transaction
- Create a Homepage with frames, animation, background sound and hyperlinks
- Designing simple server side program which accept some request form the client and respond
- Develop interface with database (MS-Access etc) for online retrieval and storage of data through HTML form
- Hosting a webpage.

PREFERENCE BOOKS

1. HTML-4 for World Wide Web - Castro Addison Wesley (Singapore) PVt. Ltd,. New Delhi
2. HTML 4.0 Unleashed by Rick Dranell Tech Media Publications
3. Dynamic Web Publishing - Unleashed Tech Media
4. Web Development with Visual Basic with CD ROM by Chapman. Prentice Hall of India, New Delhi
5. The XML handbook-Charles F. Goldfalb, Paul Prescod
6. Introducing .NET by James Conard Patrick Rengel, Birn Eranics, Jay Eynn Wron Publications.

COMPUTER GRAPHICS

Rationale

This subject will enable the stmknts to have awareness about fundamental graphics which can be generated through computer using programming language. 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 display. Colour CRT monitors. and Flat panel display, input and output devices

2. Output primitives
* Line drawing algorithms - DDA Algrothim and Bresenham's algorithm
* Cirde generating algorithm - circle algorithm midpoint circle algorithm
* Introduction to Region filling, flood filling and boundary filling

3. Graphics primitives in C

4. Two dimensional transformation
*Basic transformation - Translation Rotation. Scaling
*Matric representation & homogenous coordinates, Composite transformation - translation Rotation scaling
* Other transformation - 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-hame model. Bezier curves.

7. Projections
* Parallel projections
* Perspective projections

8. Animation
* Conventional and computer animation
* Design of animation sequencees
* 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 techniques
8. Creating animations

Reference Books

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

SOFTWARE ENGINEERING

RATIONAL

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's software science Mcate complexity

3. Planning

The development process an organizational structural other planning activities. Data flow diagram

4. Software Cost Estimations

Cost factors cost estimation technique, Staffing level estimation, estimation software, maintenance coss COCOMO

5. Software Requirement Definition

Problem analysis requirement engineering. The software Requirements Specifications (SRS), formal specification techniques, characteristic of a good SRS.

6. Software Design and Implementation Issue.

Fundamental design, concept design notations, design techniques, structured encoding, 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

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 system (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 IRLX system files, IRLX commands configuring user accounts, IRLX login shell disk drive supported by IRIX, system Disk Option disk and partition layout, IRIX file system, 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 chipset 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, Autostat, 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, Is, dirview, mkdir, cp, In, mv, rm, rmdir, lp, lpstat, chmode, man-t, man**.**
- 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 - Kal Hwang, Faye B Briggs.

MULTIMEDIA APPLICATION

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 contents and presentation

Detailed Contents

1. Introduction To Multimedia
Need of Multimedia
Application of Multimedia
Multimedia Hardware
Storage for Multimedia
2. Sound
MIDI Verus 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 Photos shop
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
   Making Multimedia Presentations Combining Director, Flash, and Photoshop such as Departmental
   Profile. Lesson Presentation Games and Project Presentation.

Reference Books
1. Multimedia In Practice   - Judith Jeffeoate
2. Multmedia Making It works - Tay Vaughan

NETWORK SECURITY

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 attack 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
tunneling protocol (PPTP), RSA encryption, secure socket layer (SSL), secure shell, simple key
management for IP (SKIP)

6. Visual Private Network (VPN)
Basic setting of VPN - proposing with Firewall, 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,
Applicatin 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 Practical

1. Installation of Anti - Virus Package.
2. Checking and removed 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 Publiction**.**
4. Internet Security - New Rider Publication**.**

MAJOR PROJECT

 The three month of the sixth semester shall be utilized by the students 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 institute 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). Student should be allowed 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 teacher. 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 lenat 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, 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 system and peripherals
- Bringing improvement in the existing systems/equipment.