Sixth Semester

Maintenance Of Computer system (DEC-601)

Discipline core (DC): Credit 4(3-0-2)

RATIONALE

PCs have become a necessity in Industry, offices & becoming popular in homes too. This course gives organization structure and principles of working of various other components like visual display, keyboard drives & printers etc. Diploma holders will find employment in computer industry, Repair & maintenance field.

DETAILED CONTENTS

1. CRT Display Device

Block Diagram, Principle of operation of Computer Monitor, Difference between TV & Computer Monitor. Video Display Adopters (Monocrome & Colour Graphic Adopter)

2. Printers

Printing Mechanism, Construction and working principles and Dot Matrix Printer, Inkjet Printer, Laser Printer, Printer Controller, Concentric Interface, Signals from PC to Printer & Printer to PC.

3. Keyboard & Mouse Block Diagram of keyboard Controller, keyboard switches, keyboard faults, mouse, common faults with mouse. Introduction to scanner, digitizer.

4. Buses & Ports

Different type of Buses PCI, ISA, SCSI & Ports COM 1, COM 2,
LPTI, USB.

5. Secondary Memory Principle & Construction of Floppy Disk Drive & hard disk device (HDD). Floppy disk Controller & Hard disk controller. Pen Drives, common faults with hard disk drive & floppy disk drive.

6. Mother Board

Introduction to different type of mother boards Single Board Based System, Block diagram of motherboard. Installation of Computer System.

7. Network Devices Brief Introduction & working of following HUBS, Routers, Bridges, Switches, LANS, WANS

LIST OF PRACTICALS

Operation, Maintenance, Installation & Testing of the following devices:

1 Keyboard
2 Mouse
3 Monitors
4 FDD
5 HDD
6 DOT Matrix Printer
7 Laser Printer
8 Mother board
9 CD-ROM

10 Connectors & Cables

RECOMMENDED BOOKS

1. PC Organisation by S. Chowdhury, Dhanpat Rai & Sons, Delhi
2. IBM PC Colours by Govinda Rajalu, Tata McGraw Hill Publishers, New Delhi
3. Text Book by Mark Mirasi

Digital and Data Communication (DEC-602)
Discipline core (DC): Credit 4(3-0-2)

Objective: This course deals with the advanced digital and data communication techniques. It involves the use of modems in synchronous and asynchronous data transmission. It encompasses the modern communication network and integrated services like ISDN and radio paging along with cellular mobile telephones, FAX, electronic exchanges etc. The students should understand the advantages and limitations of various analog and digital modulation systems on a comparative scale and relate to them while studying practical communication systems.

DETAILED CONTENTS

1. Introduction

Basic block diagram of digital and data communication systems, Their comparison with analog communication system. Synchronous and Asynchronous communication system.

2. Digital Communication

Basic scheme of PCM system, quantization, quantization error companding, block diagram of TDM-PCM communication system and function of each block Advantages of PCM system, concept of differential PCM (DPCM) system

3. Data Communication Hardware

UART, USART, their need in communication. Need and function of modems. Mode of modems operation (low speed, medium speed and high speed modems). Modem interconnection, Modem data methods, Modem interfacing (RS 232 interface other interfaces)

4. Network and Control Considerations

Protocols and their functions Data communication network organisation. Basic idea of various modes of digital switching Circuit switching, message switching, packet switching.

a) Basic concept of integrated services.

b) Digital Network (ISDN) its need in modern communication, brief idea of ISDN interfaces

c) Basic idea of local area Network (LAN), and its various topologies, LAN interconnection, Eathernet

d) Introduction to EPABX

5. Mobile Communication Operation of Cellular mobile telephone system. cells and frequency reuse, cell spitting, cell sectoring, interference, handover, concept of first generation analog, second

generation TDMA (GSM) and CDMA cellular system. Introduction to personal communication system (PCs). Introduction to WLL, Introduction to G 1 , G2, G 3 mobile communication

6. Facsimile (FAX)

Basic idea of FAX system and its applications; Principle of operation and block diagram of modern FAX system. Important features of modern FAX machines.

LIST OF PRACTICALS

1. Observe wave forms at pulse code modulation and demodulation
2. To study the construction and working of a telephone handset.
3. To study the construction and working of a FAX machine.
4. To study the features and working of an EPABX.
5. To study the working & features of a cellular mobile system and pagers.
6. To study the working of a LAN system.

NOTE

Visits to the sites of all types of telephone exchanges including mobile and rural exchanges be made with a view to understand their working. A comprehensive report must be prepared by all the students on these visits, especially indicating the dates and locations of their visits.

RECOMMENDED BOOKS

1. Mobile and Wireless Communication by W.Stalling, Pearson Publishers
2. Electronics Communication System by KS Jamwal, Dhanpat Rai & Co., New Delhi
3. Computer Network by Tenenbaun Andrews, Prentice Hall of India, New Delhi
4. Data Communication and Networking by Foronzan TMH, New Delhi

MICRO CONTROLLERS AND PLC (DEC-603)

Open Elective (OE): Credit 3(3-0-0)

Objective

A diploma holder in industry is called upon to design, modify and troubleshoot such control circuits. Looking at the industrial applications of PLCs in the modern industry, this subject finds its usefulness in the present curriculum. Micro-controllers have assumed a great significance in the electronic and consumer goods industry and are a very vital field..

DETAILED CONTENTS

1. Microcontroller series (MCS) – 51 Overview
    - Pin details
    - I/O Port structure

- Memory Organization
- Special Function Registers (SFRS)
- External Memory

2. Instruction Set; Addressing Modes, Instruction types
   - Timer operation
   - Serial Port operation
   - Interrupts
3. Assembly language programming
   - Assembler directives
   - Assembler operation
4. Design and Interface Examples like keypad interface, 7- segmentinterface etc
5. Introduction to PLCs(06 hrs)
   - Architectural details – Processor
   - Memory structure, I/O Structure
   - Programming terminal, Power Supply
6. Working of PLC

Basic principle, response time, effects of response time, relay replacing, Basic instructions, PLC registers and program scan

7. Instruction Set, Latching, counter, timers one shet, shift register, math, Boolean instructions
8. Ladder diagram programming
9. Applications of PLCs in industry with case studies from electronics industry

RECOMMENDED BOOKS

1. The 8051 Micro controller by I Scot Mackenzie, Prentice Hall International, London
2. The 8051 Micro Controllers Architecture, Programming and Applications by Ayala; Penram International
3. Process Control Instrumentation Technology by Johnson, Curtis; EEE Edition, Prentice Hall of India, New Delhi
4. Programmable Logic Controller by Job Dan Otter; P. H. International, Inc, USA

Medical Electronics (DEC-603)
Open Elective (OE): Credit 3(3-0-0)

Objective: A large number of electronic equipment s are being used in hospitals for patient care and diagnosis or carry out advanced surgeries. This subject will enable the students to learn the basic principles of different instruments used in medical science.

DETAILED CONTENTS

1. Anatomy and physiology
    - Elementary ideas of cell structure
    - Heart and circulatory system.
    - Central nervous system
    - Muscle action
    - Respiratory system
    - Body temperature and reproduction system

2. Overview of Medical Electronics Equipments, classification, application and specifications of diagnostic, therapeutic and clinical laboratory equipment, method of operation of these instruments

3. Electrodes

Bioelectric signals, Bio electrodes, Electrode, Electrode tissue interface, contact impedance, Types of Electrodes, Electrodes used for ECG , EEG

4. Transducers

Typical signals from physiological parameters, pressure transducer, flow transducer, temperature transducer, pulse sensor, respiration sensor,

5. Bio Medical Recorders Block diagram description and application of following instruments
    - ECG Machine
    - EEG Machine
    - EMG Machine

6. Patient Monitoring Systems
    - Heart rate measurement
    - Pulse rate measurement
    - Respiration rate measurement
    - Blood pressure measurement
    - Principle of defibrillator and pace
    - mark
    - Use of Microprocessor in patent monitoring.

7. Safety Aspects of Medical Instruments
    - Gross current shock
    - Micro current shock
    - -Special design from safety
    - consideration
    - Safety standards.

RECOMMENDED BOOKS

1. Handbook of biomedical Instrumentation by RS Khandpur

2. Biomedical Instrumentation by Cromwell,
3. Modern Electronics Equipment by RS Khandpur, TMMH, New Delhi
4. Introduction to BioMedical Electronics by Edward J. Perkstein; Howard Bj, USA

Computer Architecture and Organizations (DEC-603)
Open Elective (OE): Credit 3(3-0-0)

Objective:This course will provide the student with the knowledge of detailed organisation of currently available organisation based on bus structure & principle of working of various other components & also they learn as to how the basic components of computer interact with each other to form a working system.

DETAILED CONTENTS

1. Basic computer organisation & design

Instruction lodes, indirect & direct address, computer registers, common bus system, computer instructions, timing control, instruction memory reference, Register reference & reference instructions. Interrupts, hard wire & micro- programmed control unit.

2. Central Processing Unit

Introduction, general register organisation, control word, examples of microinstructions, stack organisation, register stack, reverse. Polish notation evaluation of anith expressions. Instruction formats, Addressing modes, 3 address instructions, 2 Address instructions.

One address instructions, zero address instructions. Types of interrupts, compare RISC & CISC.

3. Computer Arithmetic

Introduction, addition & subtraction, multiplication, & Division algorithms.

4. Register transfer & micro operations

Register transfer language, arithmetic, logic & shift micro operation:

5. Input-output organisation

Input-output interface, I bus, & interface4 module, I vs memory bus. Isolated Vs memory mapped I, Modes of data, transfer, first in first out buffer, priority interrupt, daisy chaining priority, parallel priority interrupt priority encoder, interrupt cycle, Direct memory access, DMA controller, DMA transfer.

6. Memory organisation

Memory hierarchy, main memory, memory, address, map, RAM & ROM chips, memory connection to CPU, Anxillary memory, Associative memory, Read & write operation. Cache memory, Associative maping, Virtual memory, memory management hardware, memory segmentation

RECOMMENDED BOOKS

1. Computer System and Architecture by M. Mano: Prentice Hall India Pvt. Ltd., New Delhi.
2. Computer Architecutre and Organizationn by JP Hays, MC Graw Hill company, New Delhi.

3. Computer Organization and Architecutre by W. Stallings: Prentice Hall of India Ltd., New Delhi.

ENTREPRENEURSHIP DEVELOPMENT AND MANAGEMENT (DEC-604)

Discipline Electives (DE): Credit 3(3-0-0)

Objective: In the present day scenario, it has become imperative to impart entrepreneurship and management concepts to students so that a significant percentage of them can be directed towards setting up and managing their own small enterprises. This subject focuses on imparting the necessary competencies and skills of enterprise set up and its management

COURSE OUTLINE:

SECTION – A ENTREPRENEURSHIP

1. Introduction

1.1 Concept /Meaning and its need

1.2 Qualities and functions of entrepreneur and barriers in entrepreneurship

1.3 Sole proprietorship and partnership forms of business organisations

1.4 Schemes of assistance by entrepreneurial support agencies at National, State, District level: NSIC, NRDC, DC:MSME, SIDBI, NABARD, Commercial Banks, SFC's TCO, KVIB, DIC, Technology Business Incubator (TBI) and Science and Technology Entrepreneur Parks (STEP)

2. Market Survey and Opportunity Identification

2.1 Scanning of business environment

2.2 Salient features of National and State industrial policies and resultant business opportunities

2.3 Types and conduct of market survey

2.4 Assessment of demand and supply in potential areas of growth

2.5 Identifying business opportunity

2.6 Considerations in product selection

3. Project report Preparation

3.1 Preliminary project report

3.2 Detailed project report including technical, economic and market feasibility

3.3 Common errors in project report preparations

3.4 Exercises on preparation of project report

SECTION –B MANAGEMENT

4. Introduction to Management

4.1 Definitions and importance of management

4.2 Functions of management: Importance and Process of planning, organising, staffing, directing and controlling

4.3 Principles of management (Henri Fayol, F.W. Taylor)

4.4 Concept and structure of an organisation

4.5 Types of industrial organisations

a) Line organisation b) Line and staff organisation c) Functional Organisation

5. Leadership and Motivation
a) Leadership
5.1 Definition and Need
5.2 Qualities and functions of a leader
5.3 Manager Vs leader
5.4 Theories of motivation (Maslow, Herzberg, McGregor)
6. Management Scope in Different Areas
a) Human Resource Management i) Introduction and objective ii) Introduction to Man power planning, recruitment and selection iii) Introduction to performance appraisal methods

RECOMMENDED BOOKS

1. A Handbook of Entrepreneurship, Edited by BS Rathore and Dr JS Saini; Aapga Publications, Panchkula (Haryana)

2. Entrepreneurship Development published by Tata McGraw Hill Publishing Company Ltd., New Delhi

MAJOR PROJECT WORK (DEC-605)
Discipline core (DC): Credit 4(0-0-8)

Objective: Major Project Work aims at developing innovative skills in the students whereby they apply in totality the knowledge and skills gained through the course work in the solution of particular problem or by undertaking a project. In addition, the project work is intended to place students for project oriented practical training in actual work situation for the stipulated period with a view to:

i) Develop understanding regarding the size and scale of operations and nature of field-work in which students are going to play their role after completing the courses of study.

ii) Develop understanding of subject based knowledge given in the classroom in the context of its application at work places.

iii) Develop first hand experience and confidence amongst the students to enable them to use and apply polytechnic/institute based knowledge and skills to solve practical problems related to the world of work.

iv) Develop abilities like interpersonal skills, communication skills, positive attitudes and values etc.

The individual students have different aptitudes and strengths. Project work, therefore, should match the strengths of students. For this purpose, students should be asked to identify the type of project work, they would like to execute. The activity of problem identification should begin well in advance (say at the end of second year). Students should be allotted a problem of interest to him/her as a major project work. It is also essential that the faculty of the respective department may have a brainstorming session to identify suitable project assignments for their students. The project assignment can be individual assignment or a group assignment. There should not be more than 3 students if the project work is given to a group. The project work identified in collaboration with industry should be preferred.

This practical training cum project work **should not be considered** as merely conventional industrial training in which students are sent at work places with either minimal or no supervision. This experience is required to be planned in advance and supervised on regular basis by the polytechnic faculty. For the fulfillment of above objectives, polytechnics may establish close linkage with 8-10 relevant organization for providing such an experience to students. It is necessary that each organization is visited well in advance and activities to be performed by students are well defined. The chosen activities should be such that it matches with the curricular interest to students and of professional value to industrial/ field organizations. Each teacher is expected to supervise and guide 5-6 students.

Some of the project activities are given below:

a) Projects related to designing small electronic equipment / instruments.

b) Projects related to increasing productivity in electronic manufacturing areas.

c) Projects related to quality assurance.

d) Projects connected with repair and maintenance of plant and equipment.

e) Projects related to design of PCBs.

f) Projects related to suggesting substitutes of electronics components being used.

Employable skills (DEC-606)
Discipline core (DC): Credit 2(0-0-4)

Objective: Diploma holders are required to not only possess subject related knowledge but also soft skills to get good jobs and to rise steadily at their workplace. This subject is included to develop employability skills amongst the students

DETAILED CONTENTS

1.Industrial Scenario Engineering Education and expectations of competences from an engineer by employer

2.Personality types, characteristic and features for a successful engineer

3.Professional Engineer desirable values and ethics and their development. Relation between engineering profession, society and environment

4.Managing project

·Leadership·Motivation

·Time management

·Resource management

·Computer Software

·Interpersonal relationship

·Engineer economics and fundamentals

5.Effective Communication

·Listening

Speaking

·Writing
·Presentation Technique/Seminar
·Group discussion
6.Preparing for Employment
·Searching for job/job hunting
·Resume Writing
·Interview technique in personal interview telephonic interview, panel interview, group interview, video conference
7.Managing Self
·Managers body, mind, emotion and spirit
·Stress Management
·Conflict resolution
8.Continuing professional development
·Organising learning and knowledge
·Use of computer for organising knowledge resource
9.Creativity, Innovation and Intellectual property right
·Concept and need in present time for an engineer
10.Basic rules, laws and norms to be adhered by engineers during their working