TEACHING AND EXAMINATION SCHEME
FOR DIPLOMA **II Year COMPUTER SCIENCE AND ENGINEERING**
SESSION – 2009-2010 & ONWARDS
Third Semester

Code No.	Subjects	Distribution of Time				Distribution of Max. Marks/ Duration							Total Marks
		Hours per week				University's Exam.				Sessionals			
		L	T	P	Tot	TH	Hrs.	PR	Hrs.	CT	TU	PR(S)	
CS 31	Programming in 'C'	3	2/2	3	7	70	3	50	3	30	25	25	200
CS 32	Computer Organisation	3	2/2	--	4	70	3	--	--	30	50	--	150
CS 33	Operating System Principles	3	2/2	--	4	70	3	--	--	30	50	--	150
*CS 34	Electronic Devices and Circuits	3	--	2	5	70	3	50	3	30	--	50	200
*CS 35	Digital Electronics	3	--	2	5	70	3	50	3	30	--	50	200
*CS 36	Basic Communication Engineering	3	--	2	5	70	3	--	--	30	--	50	150
CS 37	Numerical Analysis	3	2/2	2	6	70	3	--	--	30	25	25	150
	Total	21	4	11	36	490		150		210	150	200	1200
												Grand Total:	**1200**

1. L:Lecture
2.T:Tutorial
3.P:Practical
4.TH:Marks for University Examination for Theory
5.PR: Marks for University's Examination for Practical
6.CT:Marks for Class Tests
7TU:Marks for Tutorials
8.PR(S):Marks for Practical and Viva

*CS 34 Same as EL 34 *CS 35 Same as EL 35 *CS 36 Same as EL 36

TEACHING AND EXAMINATION SCHEME
FOR DIPLOMA **II Year COMPUTER SCIENCE AND ENGINEERING**
SESSION – 2009-2010 & ONWARDS
Fourth Semester

Code No.	Subjects	Distribution of Time				Distribution of Max. Marks/ Duration							Total Marks
		Hours per week				University's Exam.				Sessionals			
		L	T	P	Tot	TH	Hrs.	PR	Hrs.	CT	TU	PR(S)	
CS 41	Data Structures Through 'C'	3	2/2	3	7	70	3	50	3	30	25	25	200
CS 42	System Programming	3	--	3	6	70	3	--	--	30	--	50	150
CS 43	Modern Operating System	3	2/2	--	4	70	3	--	--	30	50	--	150
CS 44	Data Base Management System	3	2/2	--	4	70	3	--	--	30	50	--	150
CS 45	Introduction to Microprocessor	3	--	3	6	70	3	50	3	30	--	50	200
CS 46	Data Communication	3	2/2	--	4	70	3	--	--	30	50	--	150
CS 47	PC Maintenance and Trouble Shooting	2	--	3	5	70	3	--	--	30	--	50	150
	Total	20	4	12	36	490		100		210	175	175	1150
												Grand Total:	**1150**

1. L:Lecture
2.T:Tutorial
3.P:Practical
4.TH:Marks for University Examination for Theory
5.PR: Marks for University's Examination for Practical
6.CT:Marks for Class Tests
7TU:Marks for Tutorials
8.PR(S):Marks for Practical and Viva

TEACHING AND EXAMINATION SCHEME
FOR DIPLOMA **III Year COMPUTER SCIENCE AND ENGINEERING**
SESSION – 2009-2010 & ONWARDS
Fifth Semester

Code No.	Subjects	Distribution of Time				Distribution of Max. Marks/ Duration							Total Marks
		Hours per week				University's Exam.				Sessionals			
		L	T	P	Tot	TH	Hrs.	PR	Hrs.	CT	TU	PR(S)	
CS 51	Object Oriented Programming	3	2/2	3	7	70	3	50	3	30	25	25	200
CS 52	System Analysis and Design	3	2/2	--	4	70	3	--	--	30	50	--	150
CS 53	Computer Networks	3	2/2	--	4	70	3	--	--	30	50	--	150
CS 54	Advanced Database Management System	3	2/2	3	7	70	3	50	3	30	25	25	200
CS 55	Visual Programming	3	--	3	6	70	3	50	3	30	--	50	200
CS 56	**Elective – I**												
	CS 561 Computer Graphics	3	1	--	4	70	3	--	--	30	50	--	
	CS 562 UNIX Utilities and Shell Programming	2	--	2	4	70	3	--	--	30	--	50	150
CS 57	**Elective – II**												
	CS 571 Human Computer Interaction	2	2	--	4	70	3	--	--	30	50	--	
	*CS 572 Computer in Business Systems	2	--	2	4	70	3	--	--	30	--	50	150
	Practical Training (24 Working Days)							100					100
												Grand Total:	**1300**

*CS 572 Common for All Branches of Engineering

TEACHING AND EXAMINATION SCHEME
FOR DIPLOMA **III Year COMPUTER SCIENCE AND ENGINEERING**
SESSION – 2009-2010 & ONWARDS
Sixth Semester

Code No.	Subjects	Distribution of Time				Distribution of Max. Marks/ Duration							Total Marks
		Hours per week				University's Exam.				Sessionals			
		L	T	P	Tot	TH	Hrs.	PR	Hrs.	CT	TU	PR(S)	
CS 61	Design and Analysis of Algorithms	3	2	--	5	70	3	--	--	30	50	--	150
CS 62	Software Engineering	3	2	--	5	70	3	--	--	30	50	--	150
CS 63	Advanced Computer Architecture	3	2/2	--	4	70	3	--	--	30	50	--	150
CS 64	System Administration	3	--	3	6	70	3	50	3	30	--	50	200
CS 65	Programming in Java	3	2/2	4	8	70	3	50	3	30	25	25	200
CS 66	**Elective – III**												
	CS 661 Data Base Administration	2	--	2	4	70	3	--	--	30	--	50	
	CS 662 Computer and Network Security	3	1	--	4	70	3	--	--	30	50	--	
	CS 663 Soft Computing Methods	3	1	--	4	70	3	--	--	30	50	--	150
CS 67	**Elective – IV**												
	*CS 671 Management	2	2	--	4	70	3	--	--	30	50	--	
	*CS 672 Entrepreneurship Development	2	2	--	4	70	3	--	--	30	50	--	
	*CS 673 Production System Management	2	2	--	4	70	3	--	--	30	50	--	150
	Project (24 Working Days)							100					100
												Grand Total:	**1250**

*CS 671/CS 672/ CS 673 Common for All Branches of Engineering

PROGRAMMING IN "C"

CODE CS 31

L	T	P
3	2/2	3

RATIONALE

'C' is system programming language and also structured programming language, In 'C' programming language we consider various syntax used in programming. By having good knowledge of 'C', students can write modular application and system programs. 'C' is mainly used in software developments, projects involving compiler design, operating system design, system software etc. By acquiring a sound knowledge of 'C' students will be able to understand the concept of all the application areas.

CONTENTS

1. Introduction :

- 1.1 Scope of 'C' Language
- 1.2 Distinction and similarities with other HLLs
- 1.3 Special features and Application areas

2. Elements of 'C' :

- 2.1 Character set
- 2.2 Key words
- 2.3 Data types
- 2.4 Constants and Variables
- 2.5 Operators: unary, binary, ternary
- 2.6 Operator precedence

3. Console Input-Output :

- 3.1 Types of I-O
- 3.2 Console I-O
- 3.3 Unformatted console I-O: getchar(),putchar(), gets(), puts(), getch(),getche()
- 3.4 Formatted I-O: scanf(), printf()

4. Control Flow :

- 4.1 Statements and blocks
- 4.2 if
- 4.3 switch
- 4.4 Loops: for, while, do-while
- 4.5 goto and labels
- 4.6 break, continue, exit
- 4.7 Nesting control statements

5. Arrays :

- 5.1 Basic concepts
- 5.2 Memory representation
- 5.3 One dimensional array
- 5.4 Two dimensional array
- 5.5 Three dimensional array

6. Functions :

- 6.1 Basic concepts
- 6.2 Declaration and prototypes
- 6.3 Calling
- 6.4 Arguments
- 6.5 Scope rules
- 6.6 Recursion
- 6.7 Storage classes types

6.8 Library of functions: math, string, system

7. Pointers :

7.1 Basic concepts
7.2 &, * operator
7.3 Pointer expression: assignment, arithmetic, comparison
7.4 Dynamic memory allocation
7.5 Pointer v/s Arrays
7.6 Array of pointers
7.7 Pointer v/s Functions

8. Structure, Union and Enumerated Data Types :

8.1 Basic concepts
8.2 Declaration and memory map
8.3 Elements of structures
8.4 Structure v/s array
8.5 Structure v/s function
8.6 Union
8.7 Enumerated data types : typedef, enum
8.8 Self-referential structures

9. File Handling :

9.1 Types of files
9.2 File organization
9.3 Opening, reading, writing, closing
9.4 Text and binary file.

PRACTICALS

1. Problems based on arithmetic expression, fixed mode arithmetic
2. Problems based on conditional statements and control structures.
3. Problems based on arrays (1-D, 2-D), functions, pointers, files
4. Problems based on string and character manipulation.

REFERENCE BOOKS :

1. 'C' Programming — Stephen Kochan
2. Programming with 'C' — Schaum's Series
3. 'C' Programming — V.Balguru Swami
4. 'C' Programming — Kernighan & Ritchie
5. Let us 'C' — Yashwant Kanetkar

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COMPUTER ORGANISATION

CODE CS 32

L	T	P
3	2/2	--

RATIONALE

The aim of this course is to provide adequate knowledge about computer hardware. In this course student are taught about evolution of the computer (how computer technology developed from the early days) CPU (Central processing unit) architecture, Memory management, File organisation, and other peripherals.

By acquiring adequate knowledge of this subject student may be able to understand the hardware functioning of the computer and also get an over all idea of the computer system organisation. After completing this course, the student will be able to undertake maintenance and repair tasks of computer hardware at IC level.

CONTENTS

1. Over View of Computer Oaganisation :

1.1 Evolution of computer,
1.2 Von Neumann architecture,
1.3 Computer generations,
1.4 Microprocessors and micro-computers design methodology

2. Register and Micro - Operations :

2.1 Register
2.2 Register transfer
2.3 Arithmetic micro operations
2.4 Logic micro operations
2.5 Shift micro operations
2.6 Control functions.

3. Basic Computer Organisation :

3.1 Instruction codes
3.2 Computer Instructions
3.3 Timing and Control
3.4 Execution of instructions
3.5 I/O and interrupt

4. Control Logic :

4.1 Introduction
4.2 Hardwired control
4.3 Micro programmed control units
4.4 Bit-sliced micro programming unit
4.5 Concept of nano programming

5. Central Processor Organisation :

5.1 Processor Bus organisation
5.2 ALU : Simple and floating point
5.3 Stack Organisation
5.4 Instruction formats and design
5.5 Addressing schemes
5.6 Data transfer and manipulation
5.7 Program control

6. Arithmetic Processor Organisation :

6.1 Comparison and subtraction of unsigned binary numbers
6.2 Addition and subtraction Algorithm

6.3 Multiplication and division algorithms,
6.4 Processor configuration
6.5 Floating point operations.

7. Input / Output Organisation :

7.1 Peripheral devices
7.2 I/O processors
7.3 DMA
7.4 Interrupt handling
7.5 Data communication
7.6 Multiprocessor organisations

8. Memory Organisation :

8.1 Concept of primary and secondary memory
8.2 Memory hierarchy
8.3 Cache memory
8.4 Associative memory (CAM)
8.5 Virtual memory concept
8.6 Memory management unit

REFERENCE BOOKS :

1. Computer Organization and Design — Pal Choudhary (PHI)
2. Structured Computer Organization — Tanenbaum (PHI)
3. Computer Organization and Architecture — Stallings (PHI)
4. Computer Architecture and Organisation — John P. Hayes
5. Computer Organisation — Hamacher, Vranesic & Zaky
6. Computer System Architecture — Morris Mano
7. Introduction to Digital Computer Design — V. Rajaraman

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OPERATING SYSTEM PRINCIPLES

CODE CS 33

L	T	P
3	2/2	--

RATIONALE

This course is aimed at teaching the basic concepts of operating system principles, Memory management, job scheduling, multiprogramming, concurrent device operations deadlocks, buffer management etc.

CONTENTS

1. Introduction :

1.1 Operating system concepts
1.2 Purpose of an operating system
1.3 Early systems
1.4 Batch system
1.5 Spooling,
1.6 Multiprogramming,
1.7 Time sharing,
1.8 Real time systems
1.9 Multiprocessor system
1.10 The user view of the OS
1.11 System calls and services

2. CPU Scheduling :

2.1 Scheduling concepts
2.2 Processor control block
2.3 Threads
2.4 Scheduling queues
2.5 Schedulers
2.6 Scheduling algorithms : FCFS, SJF, Priority, Preemptive and Round robin
2.7 Multilevel queues
2.8 Multilevel feedback queues
2.9 Algorithm evaluation.

3. Deadlocks :

3.1 What is Deadlock ?
3.2 Deadlock characteristics
3.3 Deadlock prevention and avoidance
3.4 Deadlock Detection and recovery.

4. Memory Management and Virtual Memory :

4.1 Resident monitor
4.2 Swapping
4.3 Multiple partitions
4.4 Paging
4.5 Segmentation
4.6 Fragmentation
4.7 Virtual memory concept
4.8 Demand paging
4.9 Page replacement
4.10 Page replacement algorithms
4.11 Allocation algorithms
4.12 Thrashing.

5. Operating System Services and File Systems :

5.1 File concepts and file operations
5.2 Device directory

5.3 Access methods
5.4 Allocation method
5.5 Free space management
5.6 Contiguous allocation
5.7 Dynamic storage allocation
5.8 Linked allocation
5.9 Indexed allocation
5.10 Directory systems
5.11 File protection.

6. Disk Scheduling :

6.1 Physical characteristics
6.2 Disk scheduling algorithms
6.3 Selecting a disk scheduling algorithm

REFERENCE BOOKS :

1. Operating System — Silber Schaltz.
2. Operating System — Tannenbaum.
3. Operating System — H.M. Deitel
4. Operating System — Stallings

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ELECTRONIC DEVICES AND CIRCUITS

	L	T	P
CODE CS 34			
EF 34/ EL 34/ IE 34	3	--	2

RATIONALE

Today is the day of electronics. This subject covers the basic concept of electronics for engineers, this subject is foundation of electronics which helps the student to study the other subject.

CONTENTS

1. Vacuum Tubes :

1.1 Types of emissions.
1.2 Brief idea of construction, characteristics, working and applications of

- 1.2.1 Diode Valve.
- 1.2.2 Triode Valve.
- 1.2.3 Tetrode Valve.
- 1.2.4 Pentode Valve.
- 1.2.5 Photo Tube.

2. Semiconductor and PN Junction :

2.1. Metal, non metals and semiconductors and their Energy Band Diagram.
2.2 Intrinsic and Extrinsic Semiconductors.
2.3 Effect of temperature on extrinsic semiconductor
2.4 Energy band diagram of extrinsic semiconductor
2.5 Fermi Level and fermi dirac distribution
2.6 Drift and diffusion current
2.7 Hall effect
2.8 P-N Junction Diode

- 2.8.1 Space charge region, Barrier potential and effect of temperature
- 2.8.2 Energy band diagram
- 2.8.3 Biasing of diode.
- 2.8.4 V-I characteristics
- 2.8.5 Static and dynamic resistance
- 2.8.6 Transition and diffusion capacitance
- 2.8.7 Zenner and Avalanche breakdown

2.9 Working, characteristics and application of

- 2.9.1 Tunnel diode
- 2.9.2 Zener diode
- 2.9.3 Varactor diode
- 2.9.4 Photo diode
- 2.9.5 Light emitting diode (LED)

2.10 Photo conductors
2.11 Cds photo conductive cells and photo voltaic cell.

3. Bipolar Junction Transistor (BJT) :

3.1 Constructional details of PNP and NPN transistors
3.2 Working of a transistor

- 3.2.1 Charge transport phenomenon
- 3.2.2 Transistor amplifying action
- 3.2.3 Relation between different currents in a transistor
- 3.2.4 Simple problems

3.3 Configuration of transistor (CB, CE and CC)
3.4 Behavior of BJT in Active, Cut off and Saturation regions

3.4.1 Transistor as a switch
3.4.2 Transistor as an amplifier

4. Transistor Biasing and Bias Stability :

4.1 D.C. and A.C. Load line.
4.2 Operating point and its stability
4.3 Factors affecting bias stability
4.4 Stability factors
4.5 Bias stabilization
4.6 Calculation of operating point and stability factor for

4.6.1 Fixed Bias Circuit.
4.6.2 Collector to base biasing.
4.6.3 Voltage Divider biasing (Self bias)

4.7 Bias Compensation techniques using

4.7.1 Diode.
4.7.2 Thermistor and Sensistor.

4.8 Thermal stability and Thermal runaway

5. Small Signal Transistor Amplifier :

5.1 CB, CE and CC amplifier and their low frequency small signal equivalent circuit using hybrid parameters.
5.2 Calculation of voltage gain, current gain, input impedance, output impedance and power gain for resistive loads. (Av, Ai, Zi, Zo, Avs, Ais, and Ap)
5.3 Analysis of emitter follower circuit
5.4 Approximate analysis of CE amplifier with and without R_E , Emitter follower circuits
5.5. Classification of amplifiers

6. Field Effect Transistor :

6.1 Construction, operation and characteristics of JFET , E and D MOSFET
6.2 Biasing of FET
6.3 Small signal model of JFET
6.4 Terminology used with JFET
6.5 Precaution for handling of MOSFETs

7. Rectifiers and Power Supplies :

7.1 Working of rectifiers

7.1.1 Half wave rectifier
7.1.2 Centre tape full wave rectifier
7.1.3 Bridge rectifier

7.2 Analysis of rectifiers (for all type)

7.2.1 Calculations for average and RMS values
7.2.2 PIV of diodes
7.2.3 Ripple factor
7.2.4 Regulation and efficiency
7.3 Calculation of ripplefactor and working of following filters:

7.3.1 Capacitance filter
7.3.2 Inductance filter

7.3.3 L-C and π (Pie) filters

7.4 Voltage Multipliers
7.5 Regulated power supply using zener diode

7.5.1 Simple problems on zener regulator.

PRACTICALS

1. To plot the V-I characteristics of P-N diode and LED.
2. To plot the V-I characteristics of zener diode and study of zener diode regulator circuit
3. To plot the V-I characteristics of PNP transistor in CB, CE and CC configuration
4. To plot the V-I characteristics of NPN transistor in CB, CE and CC configuration and calculate h-parameter for CE configuration.
5. Study of the different biasing circuits and observe the effect of component variation on operating point
6. Study of half wave and full wave rectifiers.
7. Study of bridge rectifier.
8. To study the filter circuits and measure the ripple factor.
9. To plot the V-I characteristics of JFET
10. To plot the V-I characteristics of MOSFET.
11. To study the voltage multipliers.
12. To Study Emitter follower circuits and measure its input and output impedances
13. To study the behavior of Cds photo conductive, photo voltaic cell and photo conductors

REFERENCE BOOKS :

1. Electronic Devices & Circuits — Millman & Halkias
2. Electronic Devices & Circuits — G.K. Mittal
3. Electronic Devices & Circuits — A.Mottershed
4. Functional Electronics — K.V. Ramanan
5. Electronic Devices & Circuits — Mathur, Kulshrestha & Chadda
6. Electronic Devices & Circuits — Sanjeev Gupta

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DIGITAL ELECTRONICS

	L	T	P
CODE CS 35			
EB35/ EF 35/EL 35/ IE 35	3	--	2

RATIONALE

Basic digital electronics is the requirement of modern computer, microprocessor and digital communication systems. On account of reliability and accuracy digital electronic systems are replacing conventional analog systems. A diploma pass out having knowledge of digital system will be useful to the industries.

CONTENTS

1. Introduction :

1.1 Digital signal and its representation
1.2 Advantages of digital techniques

2. Number System :

2.1 Decimal, binary, octal and hexa-decimal number system
2.2 Conversion of a number from one system to another system
2.3 Binary addition, subtraction and multiplication
2.4 Representation of positive and negative numbers
2.5 1's complement and 2's complement
2.6 Subtraction using 2's complement
2.7 Parity bit
2.8 Binary codes (Gray, Excess -3, Hamming codes), ASCII code
2.9 Floating point number

3. Logic Gates :

3.1 Introduction
3.2 Symbol and truth table of NOT, AND, OR, NAND, NOR, EX-OR and EX-NOR gates
3.3 Universal gates
3.4 Positve, negative and tristate logic

4. Logic Families :

4.1 Classification of digital ICs.
4.2 Characteristics of digital ICs.
4.3 RTL/RCTL
4.4 DTL
4.5 TTL logic - Operation of TTL NAND gate, open collector and totem - pole output, characteristics of TTL, TTL subfamilies
4.6 Concept of ECL and I^2 L.
4.7 PMOS, NMOS and CMOS (NAND, NOR, NOT) Circuits.
4.8 Comparison of logic families
4.9 Interfacing TTL with CMOS family

5. Boolean Algebra :

5.1 Historical review - logical statements, logical constants and variables, truth table
5.2 Boolean operators
5.3 Postulates of Boolean algebra
5.4 Laws of Boolean algebra
5.5 Duality theorem
5.6 De' Morgan's theorem
5.7 Simplification of Boolean expressions
5.8 Verification of Boolean expressions using truth table

6. Minimization Techniques (K-Mapping) :

6.1 Representation of Boolean expression - min. and max. term SOP, POS
6.2 Conversion of truth tables in POS and SOP form
6.3 Karnaugh map upto 4 variables - implication of logic function with and without don't care conditions
6.4 Realization of logic diagrams using NAND/NAND, NOR/NOR gate

7. Combinational Logic Design :

7.1 Binary half and full adder
7.2 Binary half and full subtractor
7.3 Binary serial, parallel and BCD adder
7.4 Parity bit generator and checker
7.5 Binary comparator
7.6 Multiplexer

7.6.1 4 to 1 multiplexer
7.6.2 16 to 1 multiplexer

7.7 Demultiplexer

7.7.1 1 to 4 Demultiplexer
7.7.2 1 to 16 Demultiplexer

7.8 Encoder

7.8.1 Decimal to BCD

7.9 Decoder

7.9.1 BCD to Decimal
7.9.2 BCD to seven segment

8. Sequential Systems :

8.1 Introduction
8.2 Symbol, logic circuit, truth table of R-S, J-K, M/S J-K,D,T flip-flops
8.3 Edge and level triggering
8.4 Shift registers

8.4.1 Left, right and bi-direction
8.4.2 Series and parallel
8.4.3 Universal shift register

8.5 Asynchronous and synchronous counters - up, down and up-down
8.6 Mod counters - Mod 5, Mod 9, decade counter
8.7 Ring counters, Johnson counter
8.8 Programmable counters
8.9 Use of shift register for simple binary multiplication and division.

PRACTICALS

1. Verify the truth tables of NOT, AND, OR, NAND, NOR, EX-OR, EX-NOR gates
2. Design a NOT, AND, OR, EX-OR, EX-NOR gates using universal gates
3. Design a binary half and full adder
4. Design a binary half and full subtractor
5. Study of BCD to 7 segment decoder
6. Verify the truth table of RS, D, J-K, M/S J-K,D,T flip-flops.

7. Study of asynchronous binary ripple up, down and up-down and different mod counters
8. Study of synchronous counters
9. Study of decade counter
11. Study of programmable counter
12. Study of a shift register using flip flops
13. Study of ring counter using flip flops

REFERENCE BOOKS :

1. Digital Principles & Applications — Malvino Leach.
2. Integrated Electronics — Millman & Halkias
3. Digital Electronics — T.C. Bartee
4. Digital Electronics Practice Using IC's — R.P. Jain.
5. Modern Digital Electronics — R.P. Jain
6. Digital Electronics — L. Solanki
7. Digital Intregrated Circuit — K.R. Botker
8. Digital Design — Flloyd
9. Digital Logic Design — Morris Mano.

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BASIC COMMUNICATION ENGINEERING

	L	T	P
CODE CS 36			
EF 36/EL 36	3	--	2

RATIONALE

For the transmission and reception of signals in industry and domestic life the basic knowledge of communication engineering is essential. The study of the subject provides the basic knowledge of various modulation, demodulation technique which further provide the fundamentals to understands the operation of communication systems. Detailed knowledge of radio receiver is also included in the syllabus.

CONTENTS

1. Introduction :

- 1.1 Basic component of communication
- 1.2 Definition of modulation
- 1.3 Need of modulation in communication
- 1.4 Definition of AM, FM, PM, PAM, PPM, PWM and PCM

2. Noise and Cross Talk :

- 2.1 Classification of noise
  - 2.1.1 Atmospheric noise
  - 2.1.2 Shot noise
  - 2.1.3 Thermal noise
  - 2.1.4 Transit time noise
  - 2.1.5 Miscellaneous noise
- 2.2 Noise figure
- 2.3 Concept of cross talk
- 2.4 Cross-talk elimination techniques

3. Amplitude Modulation :

- 3.1 Derivation of AM wave equation
- 3.2 Modulation index for sinusoidal AM
- 3.3 Frequency spectrum for sinusoidal AM
- 3.4 Total power in AM wave.
- 3.5 Effective voltage and current for sinusoidal AM
- 3.6 BJT collector amplitude modulator
- 3.7 General idea of carrier and sideband suppression
- 3.8 Balance modulator circuits
  - 3.8.1 Using diode
  - 3.8.2 Using FET
- 3.9 SSB generation by filter and phase shift methods
- 3.10 Block diagram of AM transmitter

4. Frequency Modulation :

- 4.1 Derivation of FM wave equation
- 4.2 Modulation index and frequency deviation for FM
- 4.3 Frequency spectrum for sinusoidal FM
- 4.4 FET reactance and varactor diode FM modulator circuits
- 4.5 Block diagram of FM transmitter using direct and indirect method (Armstrong method)
- 4.6 Comparison of AM and FM system

5. Radio Receivers :

5.1 Various types of receivers
5.2 Receiver characteristics and their measurements
5.3 Electronic tuning system
5.4 AM demodulator - envelope detection, product demodulator (SSB detection circuit)
5.5 FM demodulator - balance slope, Foster Seely and ratio detector circuit
5.6 Block diagram of Super heterodyne AM receiver and circuit of each stage
5.7 Block diagram of FM receiver

PRACTICALS

1. Generation of AM and measurement of the modulation index.
2. Perform the AM demodulation (Envelope detector)
3. Generation of F.M.
4. Operation of standard R.F. signal generator.
5. Measurement of selectivity, sensitivity, fidility of radio receiver
6. Study of F.M. demodulation.
7. Assembling of two band radio receiver.
8. Alignment and tunning of a transistor radio receiver.
9. Fault finding exercise in a radio receiver.

REFERENCES BOOKS :

1. Communication System. George Kannedy.
2. Radio Engg. G.K. Mithal.
3. Electronic Communications. Roddy & Coolen.
4. Carrier Communication N.N. Biswas

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NUMERICAL ANALYSIS

CODE CS 37

L	T	P
3	2/2	2

RATIONALE

Students of computer science diploma course are expected to gain adequate knowledge of numerical method and computation, optimization techniques. Numerical Methods and Techniques are widely useful in the various problems solving in Scientific and Engg. Application optimization techniques are essential in industry in project management, inventory system and resources management. Hence this course is introduced to teach the students, the above concepts and also learn about the application of the same to various problems solving. Computer programs should also be developed for solving the numerical problems by way of introducing the algorithms and programming using 'C'.

CONTENTS

1. Introduction :

- 1.1 Approximation
- 1.2 Representation of numbers: fixed-point and floating-point
- 1.3 Rounding of numbers
- 1.4 Types of errors

2. Interpolation :

- 2.1 Finite differences : Forward, Backward, Central
- 2.2 Newton's formulas : Forward, Backward, Central, Spline

3. Numerical Calculus :

- 3.1. Numerical differentiation : Cubic Spline method
- 3.2 Numerical integration: Trapezoidal, Simpsons's 1/3 and 3/8 Rules

4. Solution of Equation :

- 4.1 Algebraic and transcendental equations : Graphical, Regular Falsi Newton Rapson method
- 4.2 Simultaneous Algebraic equation : Gauss elimination, Gauss Jordan, Gauss Seidel Method
- 4.3 Differential equations of first order : Euler's, Euler's modified, Taylor's series, Picard's and Runge - kutta method (Second and Fourth order Runge kutta)
- 4.4 Higher order differential equations : Simultaneous, Second order equations
- 4.5 Determinants and its property
- 4.6 Solutions of linear equations by determinants

5. Matrix :

- 5.1 Types of matrix
- 5.2 Matrix inverse : Gauss elimination, Gauss-Jordan method
- 5.3 Transpose
- 5.4 Solution of simultaneous equations by inverse technique
- 5.5 Eigen values
- 5.6 Eigen vectors
- 5.7 Matrix inversion by Cayley Hamilton theorem

PRATICALS

1. Numerical analysis problems using 'C' language.

REFERENCE BOOKS :

1. Numerical Analysis Bansal,Ojha

2.	Numerical Analysis	H.C.Saxena
3.	Numerical Recipe's (in C)	Press, Flannery, Teukolrky & Vetterling
4.	Numerical Methods	E. Balagurusami, TMH
5.	Numerical Techniques in 'C'	E.V. Kameshwar, BPB
6.	Comp. Oriented Numerical Methods	V.Rajaraman
7.	Computational Mathematics	Demidorich,B.P.
8.	Introductory Methods of Numerical Analysis	S.S. Sastry, PHI
9.	Applied Numerical Analysis	Gerald, AW/Pearson
10.	Elements of Computer Science	R. Agor

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DATA STRUCTURES THROUGH "C"

CODE CS 41

L	T	P
3	2/2	3

RATIONALE

This course is aimed to teach the student about data handling and comparison of various data management techniques. Student will be taught about various data structures such as stacks, queues, linked list with their implementation using simple problems. In this course they are also made familiar about various sorting and searching techniques which are used in data handling comparison of various sorting and searching methods regarding time and storage requirements. After completing this course the student will be able to apply the concepts for structured program development which involves optimization of memory and time.

"C" language is used as the vehicle to teach the above mentioned data structures.

CONTENTS

1. Introduction to Data Structure :

1.1 Information and Meaning
1.2 Types of Data structure
1.3 Introduction to array, pointer, structure

2. Memory Allocation :

2.1 Concept of memory allocation
2.2 Dynamic and static memory allocation
2.3 Advantages of dynamic over static memory allocation
2.4 Pointer and dynamic memory allocation
2.5 Implementation of pointer variable with simple example

3. Linked List :

3.1 Linear
3.2 Circular
3.3 Doubly - Linked
3.4 Polynomial Representation

4. Stack :

4.1. Representation using array and linked list
4.2. Creation of stack : Push and Pop Operation
4.3. Representation of expression : Infix, Postfix, Prefix
4.4. Inter conversion of the above expression representation
4.5. Evaluation of above expression
4.6. Recursion

5. Queue :

5.1 Representation using array and linked list
5.2 Creation of Queue : Insertion and Deletion Operation
5.3 Circular Queue
5.4 Double Ended Queue

6. Tree :

6.1 Representation of tree
6.2 Binary Tree : Array and Linked List Representation
6.3 Binary Search Tree
6.4 Tree Traversal : Preorder, Postorder and Inorder using recursive and non-recursive algorithms
6.5 B-tree
6.6 Height balance tree

7. Graphs :

7.1 Graph representation
7.2 Adjacency matrix
7.3 Adjacency lists
7.4 Adjacency multi list
7.5 Traversal schemes
(Depth first search and breadth first search).
7.6 Spanning trees : Kruskal's, dijkstra's, algorithms

8. Sorting and Searching :

8.1 Elementary sorting : insertion, selection, bubble
8.2 Efficient sorting : shell, heap, quick, merge, radix
8.3 Searching : Linear, Binary
8.4 Hashing

PRACTICALS

1. Problems based on pointer and linked list.
2. Problems based on stacks and queue.
3. Problems based on tree traversal.
4. Problems based on sorting and searching.
5. Problems based on Graphs.

REFERENCE BOOKS :

1.	Data Structure	Tenenbaum.
2.	Data Structure and Program Design	Robert L. Kruse
3.	Data structure through "C"	M.J. Augestein & others
4.	Data Structures and Algorithm Analysis	Weiss (Benjamin Gusmings / Pearson)
5.	Data Structures in C	Sengupta & Edwards, AP
6.	Algorithms in C	Sedgwick, AW/ Pearson
7.	Data Structures in C	Ammeral, Wiley

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SYSTEM PROGRAMMING

CODE CS 42

L	T	P
3	--	3

RATIONALE

This course objective is to acquaint the student with various systems programming techniques using assemblers. While the course will be taught completely in the area of assemblers, linkers, loaders, libraries, overlays, macro assemblers concepts apart from there, they will be taught the basics of compilers and interpreters the students will achieve the goal of writing complete devices driver control programs, debug utilities with the practical sessions of this course by writing programs in C. Also the students will be exposed to the lexical and parsing mechanisms of compilers.

CONTENTS

1. Introduction :

- 1.1 General Machine structure,
- 1.2 Evolution of components of a programming system,
- 1.3 Machine language,
- 1.4 Assembly language.

2. Assemblers :

- 2.1 Function
- 2.2 Format
- 2.3 Label, Pseudo, Machine Operation/Instruction
- 2.4 Data structures - Data bases
- 2.5 One pass and two pass assembler algorithms.

3. Macro Assemblers :

- 3.1 Function
- 3.2 Definitions
- 3.3 Conditional Macro
- 3.4 Single pass and two pass algorithms
- 3.5 Macro calls within macro.

4. Linkers and Loaders :

- 4.1 Functions
- 4.2 Compile and go loader
- 4.3 Absolute loader
- 4.4 Relocating loaders
- 4.5 Direct linking loaders
- 4.6 Other Loading Schemes

5. Compilers :

- 5.1 Introduction
- 5.2 Phases of compilers
- 5.3 Lexical analysis
- 5.4 Syntax analysis
- 5.5 Semantic analysis
- 5.6 Passes of compilers
- 5.7 Interpreter

PRACTICALS

Solve following by using C language.

1. Implementing Searching techniques
2. Implementing sorting techniques
3. Creating Linked List
4. Creating Binary search tree
5. Text File creation program
6. Binary File creation programs
7. Creation of symbol table
8. Lexical analysis of a statement
9. Parsing of a statement

REFERENCE BOOKS :

1. Introduction to System Software — D.M. Dhamdhere.
2. System Programming — John J. Donovan
3. Structured System Programming — Jim welsh & Michel.
4. Compiler Design — Aho, Sethi, Ullman

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MODERN OPERATING SYSTEM

CODE CS 43

L	T	P
3	2/2	--

RATIONALE

Technology has moved so quickly that processors have become cheap as compared to people time. Today processors are generally distributed throughout the organization in personal computer and workstations. Computing has been shifted to distributed phenomenon rather than centralized one. Modern Operating Systems provide exposure to new paradigms, which are designed to handle widely, distributed processors. The sequential processors are replaced by massive parallelism in which many processors function concurrently. The subject deals with the issues of distributed operating systems, sharing hardware among users, allowing users to share data among themselves, facilitating input/output and parallel operations, organizing data for rapid access and handling network communications. The concept of system software needed for large segment of systems is dealt as real time operating system.

CONTENTS

1. Distributed Operating System :

- 1.1 Introduction
- 1.2 Hardware Concepts : Multi-Processor, Parallel
- 1.3 Software Concepts : NOS, NFS, Time Sharing
- 1.4 Design Issues : Transparency, Flexibility, Reliability, Performance, Scalability

2. Communication in Distributed Systems :

- 2.1 Layered Protocols
- 2.2 Client-Server Model
- 2.3 Remote Procedure Call

3. Processes and Synchronization / Co-ordination :

- 3.1 Threads
- 3.2 Processor Allocation
- 3.3 Concurrency
- 3.4 Clock Synchronization
- 3.5 Mutual Exclusion
- 3.6 Dead Locks
- 3.7 Transactions and Atomicity
- 3.8 Election Algorithms

4. Distributed File Systems :

- 4.1 Naming
- 4.2 Remote File Access
- 4.3 File Replication

5. Protection and Security Issues :

- 5.1 Threats
- 5.2 Intrusion
- 5.3 Protection
- 5.4 Viruses/Trojan/Worms
- 5.5 Trusted Systems
- 5.6 Security
- 5.7 Authentication

6. Real Time OS :

- 6.1 Introduction
- 6.2 Clock Synchronization

6.3 Task Assignment and Scheduling
6.4 Communication Protocols

REFERENCE BOOKS :

1.	Distributed Operating System	Andrew S. Tannnenbaum,
2.	Modern Operating System	Tannenbaum, PHI.
3.	Design of Distributed Operating System	Fortier, MH.
4.	Operating System : Design and Implementation	Tennanbaum and Woodhull, PHI(2Ed.)
5.	Operating System Concepts	Silberschatt and Galvin AW/ Pearson
6.	Operating Systems	Stallings, PHI,
7.	Designing Real time systems	Craime & Martin,

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DATA BASE MANAGEMENT SYSTEMS

CODE CS 44

L	T	P
3	2/2	--

RATIONALE

This course objective is to expose the students to the theoretical concepts of introduction to data base, physical and logical data base, schema design, study of entity, rational diagram, different type of data base modules, also involves the principle of designing relational data bases, normalisation process, storing and retrieval of data, securities, features of locking.

An elementary introduction to the distributed data bases will be covered apart from this the students will be completely exposed to the practical applications of dbase III, development of application software by getting exposures to the commands, program development, After completion of the course the students will achieve full competence in the area of application software development using data base.

CONTENTS

1. Introduction :

1.1 Purpose of database systems
1.2 View of data
1.3 Data models
1.4 Database languages
1.5 Transaction management
1.6 Storage management
1.7 Database Administrator
1.8 Database users
1.9 Overall system structure

2. Entity-Relationship Model :

1.1 Basic concepts
1.2 Design issues
1.3 Mapping constraints
1.4 Keys
1.5 E-R diagram

3. Relational Model :

3.1 Structure of relational database
3.2 Codd rules
3.3 The relational algebra
3.4 The tuple relational calculus
3.5 Extended relational algebra operations
3.6 Modification of the database
3.7 Views
3.8 Brief introduction to SQL, QBE, QUEL

4. Integrity Constraints :

4.1 Domain constraints
4.2 Referential integrity
4.3 Assertions
4.4 Triggers
4.5 Functional depedencies

5. Relational Database Design :

5.1 Pitfalls in relational database design

5.2 Decomposition
5.3 Normalization
5.4 Object Relational Database System (ORDBMS)

6. Indexing and Hashing :

6.1 Basic concepts
6.2 Ordered indices
6.3 B+ tree index files
6.4 B tree index files
6.5 Static and dynamic hashing
6.6 Comparison of ordered indexing and hashing
6.7 Multiple key access

7. Transaction :

7.1 Transaction concept, state
7.2 Implementation of automacity and durability
7.3 Concurrent execution
7.4 Serializability and recoverability

8. Protocols :

8.1 Lock based protocols
8.2 Time-stamp based protocols
8.3 Validation based protocols
8.4 Deadlock handling
8.5 Insert and delete operations

9. Recovery Systems :

9.1 Failure classification
9.2 Storage structure
9.3 Recovery and automticity
9.4 Log-based recovery
9.5 Shadow paging
9.6 Recovery with concurrent transactions

REFERENCE BOOKS :

1. Database Concepts — Korth
2. Introduction to Data Base Systems Vol.I — C.J. Date
3. Data Base Management System — Jeffry Ullman
4. Fundamentals of Database Systems — Elmasri & Navathe

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INTRODUCTION TO MICROPROCESSOR

CODE CS 45

L	T	P
3	--	3

RATIONALE

The aim of this subject is to provide a comprehensive knowledge of the hardware and software aspects of microprocessor. This course introduce the principles of assembly language and machine language programming of the 8086, various interfacing devices, I/O ports - DMA etc. After completing this course students will understand the basic function of a microprocessor and assembly language programming. The knowledge of assembly language programming may be used in various microprocessor based system design and systems programming. Students will also be able to design small systems involving the application of microprocessor.

CONTENTS

1. Introduction :

1.1 Evolution and comparison of 16,32,64 bit microprocessors

2. 8086 Microprocessor :

2.1 Architecture
2.2 Instruction format
2.3 Semiconductor memory organization : RAM and ROM

3. Addressing Modes :

3.1 Data related
3.2 Branch related

4. Instruction Set :

4.1 Data transfer instruction
4.2 Arithmetic instruction
4.3 Branch instruction
4.4 Loop instruction
4.5 String operation instruction
4.6 Processor control instruction

5. Data Transfer Schemes :

5.1 Programmed data transfer
5.2 Asynchronous and Synchronous data transfer
5.3 Interrupt driven data transfer,
5.4 Direct Memory Access (DMA) data transfer
5.5 Memory mapped I/O and I/O mapped I/O

6. Memory Interfacing with 8086 :

6.1 Introduction to ROM and RAM chip commonly used pins. (e.g. CS,WE,OE,WR,RD)
6.2 Address decoding : Partial, Full, Block, PROM, PLA
6.3 Memory maps
6.4 ODD, EVEN address partitioning
6.5 Interfacing 8 and 16 bit read only memory
6.6 Interfacing 8 and 16 by read write memory

7. Programmable Chips and Interfacing with 8086 :

7.1 A/D and D/A converters
7.2 8255 (PPI)
7.3 8259 (PIC)

7.4 8257 (DMA)
7.5 8251 (USART)

8. Bus Standard :

8.1 RS-232
8.2 IEEE 488 (GPIB)

9. Brief Introduction (only Architecture) of other Microprocessor :

9.1 Motorola 68000
9.2 Pentium IV
9.3 Power PC
9.4 SPARC

PRACTICALS

1. Familiarization with Assembler (TASM/MASM)
2. Practice simple program based on instruction set.
3. Familiarization with 8086 microprocessor kit.
4. Practice interfacing memory and programmable chips with 8086.
5. Practice interfacing ADC and DAC with 8086.

REFERENCE BOOKS :

1. The 8086/8088 Family Design programming and Interfacing — John Uffenbeck, PHI
2. Microprocessor system — Liu & Gibson
3. Microprocessor X86 programming — Venugopal, rajkumar ,BPB
4. Computer interfacing & applications — Brey.
5. Microprocessor and its interfacing — D.V. Hall Tata mc-graw-hill
6. Microprocessor and microcomputer based — Mohamed Rafigzzaman
7. 68000 an introduction — Leventhal

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DATA COMMUNICATION

CODE CS 46

L	T	P
3	2/2	--

RATIONALE

Computer communication has global utility in certain fields. It is used in transmission of documents or the requisite data or documents in the fields like Libraries or Airlines, Railway reservations. The knowledge of subject will enable the student to work in organisations having such types of facilities. Today most usage of computer communication in Internet for transferring files, movies, sound at remote place and it is also used in video and audio conferencing.

CONTENTS

1. Introduction :

1.1 A Communication Model
1.2 Data Communication
1.3 Data Communication Networking
1.4 Protocols and Protocol Architecture

2. Data Transmission :

2.1 Concepts and Terminology
2.2 Analog and Digital Data Transmission
2.3 Transmission Impairments

3. Transmission Media :

3.1 Guided transmission Media
3.2 Wireless Transmission

4. Data Encoding :

4.1 Digital Data, Digital Signals
4.2 Digital Data, Analog Signals
4.3 Analog Data, Digital signals
4.4 Analog Data, Analog Signals
4.5 Spread Spectrum

5. Data Communication Interface :

5.1 Asynchronous and Synchronous Transmission
5.2 Line Configuration
5.3 Interfacing

6. Data Link Control :

6.1 Flow Control
6.2 Error Detection
6.3 Error Control
6.4 High Level Data Link Control
6.5 Other Data Link Control Protocols

7. Multiplexing :

7.1 Frequency Division Multiplexing
7.2 Synchronous Time Division Multiplexing
7.3 Statistical Time Division Multiplexing

8. Circuit Switching :

8.1 Switched Network
8.2 Circuit Switching Networks
8.3 Switching Concepts
8.4 Routing in Circuit Switched Network
8.5 Control Signaling

9. Packet Switching :

- 9.1 Packet Switching Principles
- 9.2 Routing
- 9.3 Congestion Control
- 9.4 X.25

10. Frame Relay :

- 10.1 Frame Relay Protocol Architecture
- 10.2 Frame Relay Call Control
- 10.3 User Data Transfer
- 10.4 Network Function
- 10.5 Congestion Control

REFERENCE BOOKS :

1.	Data and Computer Communication	William Stallings PHI
2.	Data Communication, Computer Networks and Open Systems	Halsall AW/Pearson
3.	Digital Communication	Haykin Willey
4.	Telecommunication and The computer	Martin PH
5.	Digital Communication Fundamentals and Applications	Sklar PH
6.	Data Communication for Engineers	Duck,Bishop,Read AW/Pearson
7.	Essential of Data Communications	Stamper AW/Benjamin-Cummings/Pearson

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PC MAINTENANCE AND TROUBLESHOOTING

CODE CS 47

L	T	P
2	--	3

RATIONALE

The objective of this course is to introduce the students to the concepts of personal computer hardware its function and external interface methods by both theoretical and practical sessions. After the completion of the concept ideas, the student will be achieving the practical interfacing techniques and design methods of various devices to the personal computers. The students will achieve full competence of need of interfacing devices to the personal computers system and trouble shooting of the failure of devices.

CONTENTS

1. Site Preparation :

1.1 Airconditioning requirement
1.2 Power requirement, suppression of power supplies disturbance (AC ripple, spikers, and RF interferences), Single and power wiring layouts, CVTS, UPS requirements, design power supply flooring.
1.3 Administration of the centre, computer room

2. Safety and Security Measures

3. Study of Construction, Operation and Interfacing of the Following Devices :

3.1 Visual display units (VGA, SVGA, AGP)
3.2 Floppy disc drives, Hard disc drive (SCSI and IDE), Compact Disk Drive, Magnetic tape drives.
3.3 Dot matrix printers, Ink jet printer,Line printer,Laser printers, Plotters
3.4 Digitizer, Mouse, Trackball, Light pen, Joystick
3.5 Magnetic ink character reader (MICR), Optical character reader (OCR), Optical Mark Reader (OMR), Bar Code Reader (BCR).
3.6 Keyboard : Extended, Internet ready keyboard.
3.7 Modem : Internal and External

4. Hardware and Software Installation :

4.1 Installation of device drivers: Printers, Plotter, CD-ROM, Soundcard, Mouse, Digitizer, SVGA card, Modem, Network cards
4.2 Preparing Hard disk : Partition, Mirroring (RAID)
4.3 Installation of Multimedia kit.
4.4 Installation of one and two operating systems in one hard disk : windows 98 and windows NT.

5. Motherboard and BIOS

6. Troubleshooting of Hardware and Software Problems :

6.1 Booting sequence
6.2 Booting problems
6.3 Config.sys file
6.4 Autoexec.bat file
6.5 Debug.com file
6.6 Scandisk and Defrag
6.7 Windows registry
6.8 System information

7. Servicing of Peripherals :

7.1 Servicing keyboard
7.2 Servicing of printers : Dot matrix, Laser printer, Ink jet printer
7.3 Servicing monitors
7.4 Servicing power supply : Linear and switched mode

PRACTICALS

1. Basic Trouble Shooting :

1.1 Basic trouble shooting
1.2 Procedure - checking.
1.3 Discrete components
1.4 Electromechanical
1.5 Components - Integrated circuits - RAM - ROM - use of digital
1.6 Voltmeters, Logic probes, oscilloscopes in trouble shooting.

2. Study of Personal Computer :

2.1 System unit : Mother board , HDC, FDC, CD-ROM
2.2 CRT
2.3 Keyboard
2.4 Floppy drives and its assembling.

3. Computer installation test - software test :

3.1 RAM test.
3.2 Asynch communication lines testing
3.3 Testing printer heads having and cable wiring.
3.4 Installing one and two operating system in one hard disk
3.5 Installing internal and external modem

4. Servicing disc drives :

4.1 Maintaining disc drives
4.2 Trouble shooting disc drives
4.3 Alignments and adjustments
4.4 Checking individual
4.5 Circuits and mechanism

5. Servicing printers : Printer problems - periodic cleaning and maintenance, Trouble shooting - adjusting specific sub system :

5.1 Servicing PC's
5.2 Starting problems - Run problems
5.3 Display problems
5.4 Keyboard problems
5.5 I/O problems
5.6 Power supply problems

REFERENCE BOOKS :

1. PC Trouble Shooting and Repair Guide — BPB publication.
2. PC Trouble Shooting and Repair Guide — Peter Norton.
3. Trouble Shooting and Repairing the New Personal Computers — Margolis Art
4. Microprocessor Interfacing Techniques — R. Zaks Austio
5. The Complete Reference PC Hardware — Craig Zacker, John Rowue TMH

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