SEMESTER I

Course code: DMA33003

DSC 3A: Computer Maintenance - I
Analog & Digital Electronics

Credits: Theory – 04   **60 Hours**

COURSE OUTCOME:

After successful completion of the course, the student is able to

CO1. Understand in details with examples circuit controls
CO2. Write down in depth protective devices
CO3. Understand the details of semi-conductor devices
CO4. Understand in details with application- operational amplifiers
CO5. Understand the classification and characteristics of different logic families
CO6. Learn in details with examples number system and data conversion

Unit - 1   **15 Hours**

CIRCUIT CONTROL & PROTECTIVE DEVICES: Switch: Switching action, Types**,** Fuses: Introduction and fuse rating. Batteries: Primary and secondary, cell & battery, voltage & circuit of cell, cell life, Types. Transformer: Introduction, Principle, AF/RF (Impedance), KIRCHOFF'S LAWS - Introduction, KCL, KVL, voltage divide rule, current divide rule.

SEMICONDUCTORS: Semiconductors, Intrinsic, Extrinsic, Major and Minor charge carriers, Mobile & immobile ions, difference b/w conductors, insulators & semi conductors.

P-N JUNCTION: Introduction, formation of depletion layer, barrier voltage, Biasing P-N junction-forward bias & reverse bias.

P-N JUNCTION DIODE: Introduction, V-I characteristics-Forward bias & reverse bias, Ideal diode, static & dynamic resistance of a diode, diode application and power & current rating of a diode.

Unit - 2   **15 Hours**

SPECIAL DIODE: Introduction, zener diode & specifications, & application, varactor diode & application, LED specifications and applications, photo diode & applications.

RECTIFIERS – half wave, full wave Rectifier (Qualitative Explanation).

TRANSISTORS: Introduction, Construction, symbols, Unbiased transistor, Biasing, Operation of NPN & PNP transistor, transistor currents and circuit configuration, current gain of transistor in CB and CE configuration, relation B/W alpha & beta

TRANSISTOR CHARACTERISTICS: Introduction, characteristics transistors in CB & CE configuration-i/p and o/p.

AMPLIFIERS: - Introduction and parameters – amplitude, frequencies Series and Parallel LCR Resonance circuits, Low Pass, High pass and Band Pass and Band Stop, (qualitative description)

Unit - 3   **15 Hours**

OPERATIONAL AMPLIFIERS: Block diagram, inverting and non-inverting inputs, virtual ground,   and Op-amp applications – Inverting, non-inverting, Summing, difference amplifiers, Comparator, and integrator.

OSCILLATOR: – Introduction, Feedbacks- +ve and –ve feedback, Classification of Oscillator. The Barkhavsen criteria, Hartley oscillator, colpitts oscillator RC oscillators: phase shift oscillator, Crystal Oscillator (qualitative description).

MULTI-VIBRATOR: - astable, monostable, bistablemultivibrator applications

REGULATOR: – Zener Regulator, transistor series and shunt regulations, fixed regulator – 3 Pin regulator, IC723, Short circuit protection, SMPS– operational principle and working, Block diagram of Power Supply.

LOGIC FAMILIES: - Introduction To Logic Families, Parameters- Speed, Power Consumption, Packing Density, fan in fan out, voltage levels, noise margin, propagation delay, compatibility.

TTL: 1) TTL NOT gate,   2) TTL NAND gate,   3) TTL NOR logic

CMOS: 1) CMOS NOT gate,   2) CMOS NAND gate,   3) CMOS NOR gate

Unit - 4   **15 Hours**

NUMBER SYSTEM: Positional number system, Non-positional number system, Binary, Octal, Hexadecimal. Conversion: Decimal from another base, from decimal to another base, from base other than 10 to a base other than 10.   Shortcut method: Binary to octal, octal to binary, binary to hex, Hex to binary, fractional numbers.

 COMPUTER CODES: BCD, ASCII, EBCDIC and Unicode

COMPUTER ARITHMETIC: Binary Arithmetic (addition, subtraction, multiplication, division)

        Boolean Algebra :   fundamental concepts, postulates, principle of duality, theorems, Minimization of Boolean functions, Canonical forms of Boolean functions, conversions b/w canonical forms.

Logic gates: AND, OR, NOT, NAND, NOR (universal gates), Exclusive gates (EX-OR, EX-NOR)

Logic circuits: converting expressions to logic circuits, Realization of NAND and NOR as universal gates.

DATA CONVERSION: - D/A conversion-weighted register method, R-2R ladder method.

A/D conversion – Successive Approximation, discussion of: DAC IC 0808, ADC IC 0804

COMBINATIONAL LOGIC SYSTEMS (Qualitative Description): - Binary adder, half adder, full adder, Multiplexer (1x4, 4x1), De-multiplexer, encoder (decimal to BDC), decoder (7 segment display).

SEQUENTIAL LOGIC SYSTEMS: - Flip – Flop's RS, Clocked RS, JK Flip – Flop, master-slave, D Flip – Flop, J Flip – Flop.

SHIFT REGISTERS – Construction and working principle, parallel in and out, serial in and out registers.COUNTERS: - Synchronous counter, asynchronous counter, ring counter, ripple counter.

Reference:
1. Text book digital computer electronics – barun ray chaudhuri
2. Modern digital electronics – R P Jain
3. Principles of Electronics – Sedha
4. Digital Principles and Applications – 6th Edition – By Malvino and Leach and GautamSaha, 2007.

SEMESTER I

Course code: DMA33103

DSC 3A: Computer Maintenance - I
Analog & Digital Electronics Lab

Credits: Practical – 02   **60 Hours**

Part A

1) Junction diode input characteristics.
2) Zener diode reverse characteristics.
3) Transistor characteristics - CE mode.
4) Zener diode voltage regulator.
5) RC coupled amplifier – frequency response and Band width.
6) Voltage divider rule.
7) Current divider rule.
8) Op-amp inverting and non-inverting amplifier.
9) Op-amp adder and subtractor.
10) Op-amp comparator.
11) Rectifiers: Half Wave rectifier, Full Wave rectifier with and without filter.
12) Astable multi-vibrator.
13) Colpitt's oscillator.
14) Verification of Transistor regulator.
15) 3 pin voltage regulators.

Part B

1) Verification of Half adder and full adder.
2) Verification of Encoder (Decimal to BCD)
3) Verification of Decoder (BCD to 7 segments)
4) Verification of Mux (1x4).
5) Verification of RS, JK, and D FF's (clocked).
6) Verification of shift registers (SISO, SIPO)
7) Verification of up-down counter.
11) Verification of logic gates (Basic, Universal, exclusive gates)
12) Verification of NAND and NOR as universal gates.
13) Simplification of Boolean expression and realization using B gates.
14) Verification of Demorgan's theorem.
15) Verification of D/A converters (R-2R ladder method)
16) Verification of A/D conversion using IC 0804.
17) MS-DOS: Internal and external command (10 each), introduction to Windows (desktop, shortcut key, icons.,)

SEMESTER II

Course code: DMB33003

DSC 3B: Computer Maintenance - II
Computer System Organization and Architecture

Credits: Theory – 04   **60 Hours**

Course Outcome:

   After successful completion of the course, the student is able to

   CO1. Deliberate in details with examples Boolean algebra and logic circuits
   CO2. Learn the details of Data Representation and Computer Arithmetic
   CO3. Learn in depth Computer Organization and Design
   CO4. Learn the details of architecture of CPU
   CO5. Write down in depth Basic Computer Programming Concepts
   CO6. Deliberate the classification and characteristics of Basic Computer Programming Concepts
   CO7. Learn the classification and characteristics of Input -Output organization

Unit - 1   **15 Hours**

Data Representation and basic Computer Arithmetic: Number systems, complements.
Fixed and floating point representation, character representation, addition, subtraction, magnitude comparison.

BASIC COMPUTER ORGANIZATION (characteristics / functionality features only): Introduction – what is computer?, Hardware, software, firmware. Functional Block diagram - Input unit, Output unit, storage unit, Central Processing Unit-Arithmetic Logic Unit, Control Unit & Main Memory Unit. System concept and How System works?

BASIC COMPUTER SYSTEM AND WORKS: Main System Unit-Enclosures, Power Supplies, Motherboards & related parts, Drive system – Peripheral devices: - Keyboard, Mouse, digitizer voice recognition, vision input device, Monitor, Printer, Modem and Scanner, Plotters.
Laptop / Notebook / Portable computer, using the Computer and starting the computer
Complete Boot Process.

Motherboard: Position of the Motherboard, Bus, Components, Support circuits chipsets and Motherboard/cabinet form factors, Processor and Co-processor – Some common Processors, Modern Microprocessor, Future Processor, Front Side Bus and PC Processor Specification- at Glance.

Basic Computer Organization and Design: Computer registers, bus system, instruction set,timing and control, instruction cycle, memory reference, input-output and interrupt

Unit - 2   **15 Hours**

Central Processing Unit: Register organization, arithmetic and logical micro-operations, stack organization, micro programmed control.

MEMORY: - Primary memory - static and dynamic RAM, ROM, Parity, and ECC Memory. Secondary Memory- Memory capacity –Bits, Bytes and etc…

Physical memory organization, memory speed and its improvements. Extended memory, Upgrading / adding memory, some common memory errors.

The BIOS - BIOS Basics, PC-BIOS communications and other BIOS functions, Upgrading BIOS, Flash BIOS, BIOS setup (over-view).

Unit - 3   15 Hours

Software's: Office Automation Tools - Introduction to open office/MS office/Libre office.

Word Processing: Formatting Text, Pages, Lists, Tables

Spreadsheets: Worksheets, Formatting data, creating charts and graphs, using formulas and functions, macros, Pivot Table

Presentation Tools: Adding and formatting text, pictures, graphic objects, including charts, objects, formatting slides, notes, hand-outs, slide shows, using transitions, animations.

Operating system: - Introduction, functions of Operating System, measuring system performance, Process management in early systems, multiprogramming, multi tasking, multi threading, and multiprocessing, time sharing. Example of operating System – DOS, WINDOWS, WINDOWS NT, UNIX and LINUX (overview)

Unit - 4   15 Hours

Programming the Basic Computer: Instruction formats, addressing modes, instruction codes, machine language and assembly language, input output programming.

Input-output Organization: Peripheral devices, I/O interface, Modes of data transfer, direct memory access.

Techniques of Problem Solving: Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation, Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming.

Reference:
1. M. Mano, Computer System Architecture, Pearson Education 1992.
2. Modern Computer Hardware Course – by ManaharLotia, Pradeep Nair, PayalLotia
3. The Complete PC Upgrade & Maintenance Guide – mark Minasi (BPB Publication, 2003 Ed.)
4. Modern digital electronics – R P Jain
5. Foundation of computing by Sinha & Sinha.
6. Sushila Madan , Introduction to Essential tools,JBA,2009.
7. Anita Goel, Computer Fundamentals, Pearson, 2012

SEMESTER II

Course code: DMB33103

DSC 3B: Computer Maintenance - II
Computer System Organization and Architecture Lab

Credits: Practical – 02   **60 Hours**

Lab experiments based on computer hardwires, operating system and Office Automation Tools

SEMESTER III

Course code: DMC33003

DSC 3C: Computer Maintenance - III
Computer Programming Languages

Credits: Theory – 04   **60 Hours**

Course Outcome:
   After successful completion of the course, the student is able to

CO1.   Understand in depth Elements of C Programming
CO2.   Learn in details with examples String Handling
CO3.   Write down the details of Structures and Unions
CO4.   Understand in depth Assembly Level Programming
CO5.   Learn the details of 8086 Microprocessor Programming
CO6.   Write down in details with examples Digital Interfacing
CO7.   Learn in details with examples Multiple Microprocessor System

Unit - 1   **15 Hours**

INTRODUCTION TO C LANGUAGE: History, Features and Applications of 'C'.
Programming preliminaries – Character set, definitions and declarations of identifiers, Variables, Constants, Keywords, Data types with examples.
Operators and expressions – Various operators and expressions, Operator precedence with example programs.
Input-output statements – various types of standard input output statements, standard mathematical functions, with example programs.
Control structures – decisions making and branching statements, Decisions making and looping statements with example programs.
Arrays – Definitions and need of arrays, 1-d and 2-d arrays with example programs, passing array elements to a function, passing an entire array to a function. Pointers and two dimensional arrays, introduction to multidimensional arrays, array of pointers.

Unit - 2   **15 Hours**

String Handling – Declarations, Initialization, reading and writing of strings, operations and string functions with example programs, array of pointers to strings.
Functions – Definitions and need of functions. Library functions, user defined functions in detail, function declaration and prototypes, call by value and call by reference, functions and arrays, functions and pointers, recursion, storage classes with example program.
Structures and Unions – Definition and use of structures. Declaring, initializing and accessing structure member, arrays of structures, additional features of structure, uses of structures, introduction to union.

Unit - 3 15 Hours

Introduction To Microprocessors: Types of Computers, overview of Microcomputer structure and operation, Microprocessor evolution and types, overview of the 8086 microprocessor family, Microprocessor internal Architecture.

Introduction to programming the 8086 - Programming language, program development steps, addressing mode, instruction set, Assembler initialization and directives.

Assembly Programming: Assembler programming development tools, Microprocessor Architecture programming instruction up to loops.

8086 system connections timing and troubleshooting (overview) – using a logic analyzer to observe microprocessor bus signals, troubleshooting a simple 8086 – based microprocessor.

8086 Microprocessor Programming – Strings, Procedure and Macros. 8086 interrupts and Interrupt applications

Unit - 4 15 Hours

Digital Interfacing: Programmable parallel ports and handshake input / output, methods of parallel data transfer, Implementing handshake data transfer 8255A internal block diagram and system connections, operational modes and initialization, control words, 8255A handshake application examples – printer interface, interfacing to displays and keyboards.

Multiple Microprocessor System and Buses: 8086 / 8088 Maximum and minimum modes DMA, Data transfer. Interfacing and refreshing dynamic RAM, Math co-processor-8087 and I/O processor-8089 Multiple Bus microcomputer system, IEEE 488 HPIB, GPIP, PC - Bus EISA Bus.

Reference:
1. Programming in ANSI C – E Balagurusamy
2. Let us C – Yashwanth Kanetkar
3. Programming with C(Schaum's Outline)
4. Microprocessors and interfacing by Douglas V Hall
5. Microprocessor 8086 programming and interface – A NagoorKani
6. Introduction to Microprocessor: Software, Hardware, Programming – Lance A Leventhal
7. 8088 and 8086 Microprocessor programming interfacing – software, Hardware and Applications – by Walter A Triebe.

SEMESTER III

Course code: DMC33103

DSC 3C: Computer Maintenance - III
Computer Programming Languages Lab

Credits: Practical – 02 60 Hours

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER IV

Course code: DMD33003

DSC 3D: Computer Maintenance - IV
PC Maintenance and Trouble Shooting

Credits: Theory – 04   **60 Hours**

Course Outcome:

After successful completion of the course, the student is able to

CO1.   Deliberate the characteristics of Basic Concepts of Trouble Shooting
CO2.   Understand the details of Components of PC
CO3.   Deliberate the details of Boot processing
CO4.   Learn the details of Computer Virus
CO5.   Deliberate the classification and characteristics of Multimedia Devices
CO6.   Identify the details of Overview of Preventive Maintenance
CO7.   Deliberate in depth Advance Trouble Shooting Techniques

Unit - 1   **15 Hours**

Basic Trouble Shooting: Introduction to trouble shooting, components recognition, component failures, how to localize failure and make repairs safety precautions, trouble shooting and repair Trouble shooting index, start up problems, run problems . Tools for Disassembling & Assembling the PC.
Mother Board: Pentium4 (P4) Motherboard, The battery, Connectors on the Motherboard, Keeping CPU cool, Motherboard troubleshooting. – Cabinet form Factor.
Input Device: Keyboard – Keyboard switch, Keyboard Organization, keyboard type, Troubling shooting, keyboard ergonomic. Mouse and its type – scroll mouse, wheel mouse, connecting mouse, mouse resolution, mouse installation and trouble shooting

Unit - 2   **15 Hours**

Complete Boot Process and Windows-Xp Setup / Installation: Latest Technology in Computer Hardware – Pentium 4 with Hyper Threading (HT) Technology, Intel Pentium 4 Processor Family, Intel Net-Burst Micro-architecture. Intel 915 Chipset, Specifications, Installation, CPU Installation, onboard headers and connectors, Serial ATA (SATA) hard disks installation, BIOS setup, DDR Memory, What is Dual-channel Mode Memory?, RAID (Redundant Arrays of Inexpensive Disks).
Computer Virus – What is Computer Virus?, Types of Computer Virus, How does a virus work?, Where do viruses live?, Keeping virus away, Virus infection symptoms, Anti-virus software, What to do after infection?, some common virus myths.

Unit - 3   **15 Hours**

Multimedia – Multimedia computer, monitor, CD-ROM drive, CD-ROM installation, DVD Drive, Troubleshooting multimedia, troubleshooting video/display problem.

PEN DRIVE / THUMB DRIVE / MEMORY CARDS - Memory cards.
CD-ROM / DVD TROUBLESHOOTING GUIDE – General Inspection, cleaning, and Lubrication, Comparison of CD and DVD Specifications.
POWER SUPPLY – Operating characteristics, Circuit Description, Description of TL494, and Precautions Power – supply sizes.

Unit - 4   **15 Hours**

Outline Preventive Maintenance: To system failure, heat, cold dust, and other particles , noise interfaces , power-line, corrosion, magnetism, disk maintenance, disk drive maintenance ,using heat to spot initial troubles , display screens and health problems, disc error, soft and hard problems, soft and hard error , floppy head printer maintenance of cables.
Advanced Trouble Shooting Techniques: Techniques of the trade, components and how they fail, Using tools to find failed components other trouble shooting techniques, soldering and unsoldering, circuit board repairs, recommended, trouble shoots repair equipment, spare parts.

Reference :
1.   Modern Computer Hardware Course – by ManaharLotia, Pradeep Nair, PayalLotia
2.   The complete PC upgrade and maintenance guide. – Minasi (BPB publications)
3.   Repairing and upgrading of the IBM PC: miller (Que publications)
4.   How to maintain and service your PC – Stepheron and cliohilli

SEMESTER IV

Course code: DMD33103

DSC 3D: Computer Maintenance - IV
PC Maintenance and Trouble Shooting Lab

Credits: Practical – 02   **60 Hours**

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER V

Course code: DME33003

DSE 3A: Elective: Computer Maintenance - V
Computer Networking and Implementation

Credits: Theory – 04   **60 Hours**

Course Outcome:
    After successful completion of the course, the student is able to

CO1.   Learn in depth Elements of Data Communications and network Systems
CO2.   Learn in depth Transmission Media
CO3.   Understanding the various classifications and characteristics of Signals
CO4.   Understand in details with examples Network Models
CO5.   Learn in depth Error Detection and Corrections Algorithms
CO6.   Deliberate in details with examples Switching Concepts
CO7.   Deliberate the classification and characteristics of networking and internetworking Devices

Unit - 1   **15 Hours**

INTRODUCTION DATA COMMUNICATIONS – Components, Data Representation, Dataflow Networks – Network criteria, Physical Structures, Topology (Mesh, Star, Tree, Bus, Ring, Hybrid), Categories of Network – LAN, MAN, WAN
HISTORY OF NETWORK Protocols and Standards: Protocols (Standards organization)
TRANSMISSION MEDIA: GUIDED MEDIA – Twisted pair cable, co-axial cable, optical fiber, UNGUIDED MEDIA – Radio waves, microwaves, Infrared.
SIGNALS: ANALOG SIGNALS – Sinewave, Peak Amplitude, Period and frequency, Phase, bandwidth. DIGITAL SIGNALS – Bit interval, Bit rate, Digital Signal through a wide bandwidth medium, Digital Signal through a band limited medium, Digital v/s Analog. Signal Impairment.

Unit - 2   **15 Hours**

MULTIPLEXING – FDM (MUX and DEMUX process, Application of FDM) WDM, TDM (Interleaving, synchronizing, bit padding)
NETWORK MODELS – Layered tasks, OSI model (peer – to – peer), Layered Architecture. Functions of Layers (OSI),TCP / IP Protocol suite, ADDRESSING: Physical, Logical, Port, Specific, SWITCHING CONCEPT: Working principle of circuit switching and packet switching. Circuit switched networks.
ERROR DETECTION AND CORRECTION: - Types of Errors, Redundancy, Error detection virus Error correction.

Unit - 3   **15 Hours**

ERROR DETECTION: Parity check, Cyclic Redundancy Check (CRC), Check Sum.
Error Correction- Re-transmission, Forward Error Correction, Burst error Correction.
NETWORKING AND INTERNETWORKING DEVICES: REPEATERS, BRIDGES – types of Bridges Routers, Routing Concepts, grate ways.
ROUTING TYPES: Shortest path, flooding. Types of bridges: LAN bridges, transparent bridges, source, and mixed media bridges.
Logical Addressing: - IPV4 addresses, IPV6

Unit - 4   **15 Hours**

DATA COMMUNICATION: Asynchronous serial Data communication (Intel 8251 Chip study) Serial data Transmission method and standard – 20 – and 60 – ma current loops, RS-232, RS-422A, RS-423 and 449. Telephone / modems circuits and systems, codes CS, TDM, ISDN and PCM.
Fiber optic communication.
Asynchronous communication software on the IBM PC 8250 CHIP, Synchronous serial data communication and protocol using 8254 chip

Reference :

1.   Data Communication and Networking – Forouzan
2.   Computer Network – Tanenbaurn – 3rd Editions
3.   Computer Network – Larry L. Peterson & Bruce S. Davie
4.   Microprocessors and interfacing by Douglas V Hall

SEMESTER V

Course code: DME33103

DSE 3A: Elective: Computer Maintenance - V
Computer Networking and Implementation Lab

Credits: Practical – 02   **60 Hours**

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER V

Course code: DME33203

DSE 3B: Elective: Computer Maintenance - V
System Administration

Credits: Theory – 04   **60 Hours**

Course Outcome:

After successful completion of the course, the student is able to

CO1.   Understand the characteristics of Network operating System

CO2.   Understand in depth installing, Configuring and Managing of Peripheral Devices

CO3.   Learn the details of Files and Services of NT OS

CO4.   Learn the details of Networking Setup

CO5.   Deliberate in depth Configuring and Administration of Server

CO6.   Specify the details of Security Issues in Server

Unit - 1   **15 Hours**

Network Operating System: Introduction, installation & configuration of NT Operating System, Installation & configuration of server operating system, User & Group Managements, NTFS & share permissions, using device manager, drivers signing & signature verification, Managing ports.

Unit - 2   **15 Hours**

Installing & managing & configuring printers, Disk management tools & tasks, file systems user management, Installing Active Directory, Domain User account, configuring user accounts properties, domain groups, viewing &users effective permissions, creating and managing shares.

Files And Services of NT Operating System: Implementing files and folder NTFS & share permissions, special permission, inheritance, implementing shadow copies, implementing and managing the Distributed File System (DFS), auditing access to resources, installing and configuring terminal services, managing servers remotely using terminal services (remote desktop) backup restoring data.

Unit - 3   **15 Hours**

Installing DNS, implementing DNS in operating system networks, installing and configuring DHCP, monitoring and managing internet information services (IIS 6.0), remote access and VPN overview, configuring & implementing remote access server, configuring & implementing VPN.

Unit - 4   **15 Hours**

Configuring And Administration: Configuring & implementing remote access services, configuring & implementing routing services, configuring & implementing ICS, active directory services, implementing active directory services forest, planning implementing an OU structure, implementing server roles, restoring active roles, local and domain security policies, working with group policy, configuring the user environment by using global policy, deploying software through group policy.

Reference:

1. MS windows server 2008 administration in simple steps – by Steve Seguis
2. MS windows server 2008 in simple steps – by Marty Matthess
3. MCSE 4 in one study system windows W/CD server 2003

SEMESTER V

Course code: DME33303

DSE 3B: Elective: Computer Maintenance - V
System Administration Lab

Credits: Practical – 02   **60 Hours**

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER V

Course code: DME33403

DSE 3C: Elective: Computer Maintenance - V
Network Security

Credits: Theory – 04   **60 Hours**

Course Outcome:
   After successful completion of the course, the student is able to
   CO1.   Identify in depth Conventional OSI Security Architecture
   CO2.   Understand the characteristics of Conventional and Modern Encryption
   CO3.   Learn the details of Public Key Encryption Method
   CO4.   Deliberate in depth Authentication and Security Practices
   CO5.   Understand the details of System Security Threats
   CO6.   Deliberate in depth System Security

Unit - 1   **15 Hours**

Conventional and Modern Encryption: Model of network security – Security attacks, services and attacks – OSI security architecture – Classical encryption techniques – SDES – Block cipher Principles- DES – Strength of DES – Block cipher design principles – Block cipher mode of operation – Evaluation criteria for AES – RC4 - Differential and linear cryptanalysis – Placement of encryption function – traffic confidentiality.

Unit - 2   **15 Hours**

Public Key Encryption: Number Theory – Prime number – Modular arithmetic – Euclid's algorithm - Fermet's and Euler's theorem – Primality – Chinese remainder theorem – Discrete logarithm - Public key cryptography and RSA – Key distribution – Key management – Diffie Hellman key exchange – Elliptic curve cryptography.

Unit - 3   **15 Hours**

Authentication: Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC – SHA - HMAC – CMAC **-** Digital signature and authentication protocols – DSS.
Security Practice: Authentication applications – Kerberos – X.509 Authentication services - E-mail security – IP security - Web security

Unit - 4   **15 Hours**

System Security: Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security

---

Reference Books:

1. William Stallings, "Cryptography & Network Security", Pearson Education, Fourth Edition 2010.
2. Charlie Kaufman, Radia Perlman, Mike Speciner, "Network Security, Private communication in public world", PHI Second Edition, 2002.
3. Bruce Schneier, Neils Ferguson, "Practical Cryptography", Wiley Dreamtech India Pvt Ltd, First Edition, 2003.
4.Douglas R Simson "Cryptography – Theory and practice", CRC Press, First Edition, 1995.
5. www.williamstallings.com/Security2e.html
6. www.ocw.mit.edu/OcwWeb/Electrical-Engineering-and-Computer-Science/6857Fall2003/Course Home /index.html

SEMESTER V

Course code: DME33503

DSE 3C: Elective: Computer Maintenance - V
Network Security Lab

Credits: Practical – 02   **60 Hours**

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER V

Course code: DME33603

SEC 3A: Elective: Computer Application
PC Preventive Maintenance

Credits: Practical – 02   **60 Hours**

Course Outcome:

After successful completion of the course, the student is able to

CO1.   Learn the characteristics of different types of Operating System Softwares
CO2.   Write down the details of networking supporting OS
CO3.   Understand in details with examples Installation and Configuration of OS
CO4.   Understand the details of Day to Day Maintaining Hardware and Software

1. Installations of Operating Systems (Windows 98 and above)

2.   Network support Operating Systems like Windows- NT, Linux…

3.   Configuration- NT Administration using tools.

SEMESTER V

Course code: DME33703

SEC 3B: Elective: Computer Application
System Administration and Maintenance

Credits: Practical – 02   **60 Hours**

Course Outcome:
    After successful completion of the course, the student is able to
    CO1.   Learn the details of Basic Of LINUX Commands
    CO2.   Understand the details of Basic Of Network Supporting Windows Commands
    CO3.   Deliberate in details with examples System Administrator Operations

Linux: Linux Desktop tour.Configuring desktop environment and desktop settings.

Basic Commands: Terminal, shell,Cat, ls, cd, date, cal, man, echo, pwd, Mkdir, rm, rmdir Ps, kill
Package Installation
Synaptic package manager

Windows: Creating users – Admin and regularPath of their personal files.
Adding and changing passwords.
Difference between workgroup and domain Concept of roles
user profiles – creating and roaming Concept of Active Directory. Creating active directory in windows 2003/2008.
Process and Disk management
Windows Task manager. File systems – NTFS, FAT.
Services
Control Panel
C:/program Files, C:/system C:/windows
Add /remove new hardware (like printer), Add/remove new programmes.
Network Administration
Ipconfig,Ping, tracert, route, hostname, net, netstat, whoami
Set manual IP address, check connectivity – ipv4, ipv6
Administrator Tools
Control Panel -> Administrative Tools
Computer Management, Local security Policy, Performance Monitor, Task Scheduler, Antivirus and firewall.
Misc: Start->Accessories->System tools ->All options (Remote desktop, backup/restore etc.)
LAN – sharing printer, files and folder over the network.

SEMESTER V

Course code: DME33803

SEC 3C: Elective: Computer Application
Linux Operating System

Credits: Practical – 02   **60 Hours**

Course Outcome:

　　After successful completion of the course, the student is able to
　CO1.　　Deliberate the details of Basic LINUX Commands
　CO2.　　Learn the details of Configuring LINUX Server
　CO3.　　Understand the details of Administrative Privilege Commands in LINUX
　CO4.　　Learn in details with examples Basic of Linux Shell Programming

1. Linux Basic commands

2. Configuring Commands / Steps

3. Administrative commands and Shell Programming

SEMESTER VI

Course code: DMF33003

DSE 6A: Elective: Computer Maintenance - VII
Entrepreneurship Development

Credits: Theory – 04   **60 Hours**

Course Outcome:

After successful completion of the course, the student is able to

CO1.   Specify the characteristics of Entrepreneurship
CO2.   Deliberate the details of identification of opportunities
CO3.   Understand in depth Feasibility and financial management of the Project
CO4.   Write down the details of Project Report
CO5.   Learn the details of Enterprise Rules and regulations
CO6.   Learn the characteristics of SWOT Techniques

Unit - 1   **15 Hours**

Need scope and characteristics of entrepreneurships special schemes for a technical entrepreneur STED.

Identification of opportunities: Exposure to Demand based, Resource based, Service based important substitutes and expert promotion industries. Market surveys techniques.

Need scope and approaches for the project formulation.

Criteria for the principles of products selection and development.

Unit - 2   **15 Hours**

Structure of the project report, Choice of technology, plant and equipment.

Institutions financing procedure and financial incentives.financial ratios and their significance. Books of accounts, financial statements and funds flow analysis.

Resource management, man machine and material.The critical path method (CPM) and project evolution, review techniques (PERT).

Planning tools for establishing SSI

a. CREATIVITY AND INNOVATION,
b. PROBLEM SOLVING APPROACH
c. STRENGTH AND WEAKNESS OPPORTUNITY AND THREAT (SWOT) techniques.

Unit - 3   **15 Hours**

Techno economics feasibility of the project.Plan layout and process planning for the product.Quality control / quality assurances and testing of the products. Costing and pricing. Management of self and understanding human behavior.Sickness in small-scale industries and their remedial measures.

Unit - 4   **15 Hours**

Coping and uncertainties, stress management, and positive reinforcement

a.   Licensing registration,   b. Municipal by laws and insurance coverage

Important provision of factory acts sales of goods act partnership act.

a.   DILUTION CONTROL,

b.   SOCIAL RESPONSIBILITY AND BUSINESS ETHIQUES

Income tax, sales tax and excise rule.

Reference :
1.   Entrepreneurship Development – Kanaka
2.   Entrepreneurship Development – VasanthDesa

SEMESTER VI

Course code: DMF33003

DSE 6A: Elective: Computer Maintenance - VII
Entrepreneurship Development

Credits: Practical – 02   **60 Hours**

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER VI

Course code: DMF33203

DSE 6B: Elective: Computer Maintenance - VII
Operating System – UNIX / LINUX

Credits: Theory – 04   **60 Hours**

Course Outcome:
    After successful completion of the course, the student is able to

CO1.   Deliberate the details of UNIX /LINUX
CO2.   Learn in details with examples File System
CO3.   Specify in depth working with Permissions
CO4.   Understand the details of shell Programming
CO5.   Understand in details with examples Backup strategies
CO6.   Deliberate in depth Network Configuration

Unit - 1   **15 Hours**

Introduction: History of Unix, Directory structure of Unix & Linux, History of Linux, Comparison of various operating systems, Advantages of Linux, Flavors of Linux, Installation notes, Linux, Loader, Linux kernel

File System and Devices: File System concept ext3, ext2., File systems:- mount, fsconf and other related commands, Add user, alias, cat, cd, chmod, chown, chroot, cp, cpio, dc, df, dir,du, fdformat, find, finger, grep, gunzip, gv, gvim, gzip, halt,hostname, ifconfig, kill, logout, lpc, lpd, lp, rm, ls, man, mcopy, mformat, mkdir, more, mount, mt, mv, passwd, ping, ps, pwd, quota, quotaoff, rm, rmdir, route, set, shut down, sort, stat, strings, su, tar, tree, umount, unzip, vdir, vi, view, wc, who, whoami, zip.

Unit - 2   **15 Hours**

Working with Permissions:
Assigning file permission, Directory Permission, Using text editors, working with vi&emacs, System services and run levels, Controlling services at boot with administration tools (chkconfig& using GUI based services).

Unit - 3   **15 Hours**

Shell Programming: (C-shell, Korn shell, Bourne shell)
Backup Strategies: Choosing Backup Strategies and Operations, Choosing Backup hardware and media. Using backup software and commands.

Unit - 4 **15 Hours**

Network Configuration for Linux: Network configuration tools, Dynamic host configuration protocol, Network files system, Introduction to samba, Introduction to DNS & Apache web server

Reference :
1. Red hat Linux & fedora unlashed Authors Bill Ball & Hoyt Dust.
2. Evi Nemeth, Garth Snyder, Scott Seebass, Trent R. Hein, "UNIX System Administration"
3. Bill Ball, David Pitts, "Red Hat Linux 7 Unleashed", Techmedia SAMS Publication

SEMESTER VI

Course code: DMF33303

DSE 6B: Elective: Computer Maintenance - VII
Operating System – UNIX / LINUX

Credits: Practical – 02 **60 Hours**

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER VI

Course code: CMF33403

DSE 6C: Elective: Computer Maintenance - VII
Optical Networks

Credits: Theory – 04   **60 Hours**

Course Outcome:
   After successful completion of the course, the student is able to
   CO1.   Deliberate in depth Optical System
   CO2.   Identify in details with application of Optical Network components
   CO3.   Deliberate the details of Optical Network Architectures
   CO4.   Identify the classification and characteristics of Packet Switching
   CO5.   Deliberate the details of Access Networks
   CO6.   Deliberate in details with application of Network Design

Unit - 1   **15 Hours**

Optical System Components: Light propagation in optical fibers – Loss & bandwidth, System limitations, Non- Linear effects; Solitons: Optical Network Components – Couplers, Isolators & Circulators, Multiplexers & Filters, Optical Amplifiers, Switches, Wavelength Converters.
Optical Network Architectures: Introduction to Optical Networks; SONET / SDH, Metropolitan-Area Networks, Layered Architecture;

Unit - 2   **15 Hours**

Broadcast and Select Networks – Topologies for Broadcast Networks, Media-Access Control Protocols, Test beds for Broadcast & Select WDM; Wavelength Routing Architecture.
Wavelength Routing Networks: The optical layer, Node Designs, Optical layer cost tradeoff, Routing and wavelength assignment, Virtual topology design, Wavelength Routing Test beds, Architectural variations.

Unit - 3   **15 Hours**

Packet Switching And Access Networks: Photonic Packet Switching – OTDM, Multiplexing and De multiplexing, Synchronizations, Broadcast OTDM networks, Switch-based networks; Access Networks – Network Architecture overview, Future Access Networks, Optical Access Network Architectures; and OTDM networks.

Unit - 4   **15 Hours**

Network Design And Management: Transmission System Engineering – System model, Power penalty - transmitter, receiver, Optical amplifiers, crosstalk, dispersion; Wavelength stabilization ; Overall design considerations; Control and Management – Network management functions, Configuration management, Performance management, Fault management, Optical safety, Service interface.

Reference :
1.   Rajiv Ramaswami and Kumar N. Sivarajan, "Optical Networks: A Practical Perspective", Elsevier Publications, Third Edition, 2009.
2.   Ulysees Black, "Optical networks", Pearson education, First Edition, 2007.
3.   Guptha S.C., "Optical Fiber Communication and its Applications", PHI Learning Pvt. Ltd., Second Edition, 2012.
4.   Siva Ram Moorthy and Mohan Gurusamy, "WDM Optical Networks: Concept, Design and Algorithms", Prentice Hall of India, First Edition, 2002.
5.   Green P.E., Jr., "Fiber Optic Networks", Prentice Hall, First Edition, 1993.
6.   Biswajit Mukherjee, "Optical communication networks"–Tata McGraw Hill, First Edition, 1998.

SEMESTER VI

Course code: CMF33503

DSE 6C: Elective: Computer Maintenance - VII
Optical Networks Lab

Credits: Theory – 04   **60 Hours**

LAB CYCLE Based on to cover the theory Concept of the SYLLABUS

SEMESTER VI

Course code: DMF33603/DMF33703/DMF33803

SEC4: Computer Maintenance - VI
On Job Training/Special in House Training / Project

Credits: Practical – 02   **60 Hours**

Course Outcome:

After successful completion of the course, the student is able to

CMF33803   On Job Training

CO1.   Identify the classification and characteristics of Problems

CO2.   Write down in details with examples Trouble shooting methods

CO3.   Learn in depth Report writing

CMF34003   Special In House Training

CO1.   Identify the characteristics of current trends

CO2.   Understand the details of Method & tools

CO3.   Learn the details of Report

CMF34203   Project

CO1.   Identify the classification and characteristics of problems

CO2.   Write down in details with examples Trouble shooting methods

CO3.   Write down the details of Report

Duration: conducting and evaluating During the vacations between (II Sem. & III Sem.) and (IV Sem. & V Sem.) and evaluating C1 and C2 Respectively

Or

Special In house Training by Expert at College premises in VI Sem. - 4Hours/ Week

• In addition to their B.Sc. course, they have to take up exposure towards recent requirements during their course tenure.

• The Teacher in charge should monitor their progress periodically.

• They have to submit a report at the beginning of the V semester which should be evaluated by the teacher in-charge.

Note: Students should submit Project Report based on Training and evaluating at the end of VI Semester

---

Question Paper Pattern

Theory (4 Credits)

Time: 3 Hours   Max. Marks: 70

Part – A

I.   **Answer any Eleven Question out of given Twelve Questions.**   **11 X 2 = 22**

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.
11.
12.

   Note: Three Questions each from the Units 1, 2, 3, and 4

Part - B

II.   **Answer any Two Sub Questions from each main Question.**

13. A)   **2 X 6 = 12**
   B)
   C)
14. A)   **2 X 6 = 12**
   B)
   C)
15. A)   **2 X 6 = 12**
   B)
   C)
16. A)   **2 X 6 = 12**
   B)
   C)

Note: Each Main questions contains 3 sub questions carries 06 Marks (may have internal Split-ups) and from Units 1, 2, 3 and 4 respectively

Question Paper Pattern

Theory (2 Credits)

Time: 2 Hours   Max. Marks: 35

Part – A

III.   Answer any Five Questions.   **05 X 02 = 10**

        1.
        2.
        3.
        4.
        5.
        6.

Part - B

IV.   Answer any Five Questions out of given Six Questions.   **5 X 5 = 25**
        7.
        8.
        9.
        10.
        11.

Note: Each Main questions contains 3 sub questions carries 06 Marks (may have internal Split-ups) and from Units 1 and 2 respectively

Question Paper Pattern

Practical / Project (3 or 4 Credits)

Time: 3 Hours   Max. Marks: 70

Practicals

1.   Two Experiments/ Programs 20 Marks Each   2 x 20 = 40 Marks

    a. Write-ups 10 Marks

    b. Conducting & Results 10 Marks

2.   Viva – Voice   10 Marks

3.   Record   10 Marks

Project

1.   Project Presentation   15 Marks

2.   Project Demo   20 Marks

3.   Viva – Voice   10 Marks

4.   Record   25 Marks

Question Paper Pattern

Practical (2 Credit)

Time: 3 Hours   Max. Marks: 35

1.

    a. Experiment/ Programs /Project demo   20 Marks

    b. Conducting & Results

2. Viva – Voice   10 Marks

3. Record   05 Marks