UNIVERSITY POLYTECHNIC

Third semester

Computer Science Engineering

[Diploma in Engineering]

DCS 301: : COMPUTER HARDWARE MAINTENANCE

Semester-III

Module No.	Contents	Teaching Hours
I	Motherboard And Its Components:- Chipset basic, chipset Architecture: North / South Bridge architecture and Hub architecture. Architecture of Intel chipset 915 G & 945 G. Logical memory organization: Conventional memory, Extended memory, Extended memory, upper memory. Concept of cache memory: Internal cache, External cache (L1, L2, L3 cache). Overview and features of SDRAM, DDR, DDR2, DDR3. Features of Intel processors: Pentium, P2, Celeron, P3, P4, Pentium D and AMD processors: K6, Athlon XP, Athlon 64. Bios Basics, main functions. Motherboard Selection criteria	12
II	Storage Devices And Its Interfacing:- Recording Technique : FM, MFM, RLL Perpendicular magnetic recording, Hard disk construction and working Terms related to Hard Disk: Track, Sector cylinder, cluster, landing zone, MBR, Zone recording, write pre-compensation Formatting, Low level formatting, High level formatting, partitioning. FAT basics, Introduction to file system FAT 16, FAT 32, NTFS, Hard disk drive interface: features of parallel AT attachment (PATA), Serial ATA (SATA), ATA devices jumper selections: Master, slave, cable select, ATA cables. CDROM drive: Construction, Recording. DVD: Construction, Recording. Input & Output Devices:- Construction and Working Keyboard: Types of key switches: Membrane, Mechanical, Rubber dome, Capacitive and interface. Mouse: Mechanical, Opt mechanical, optical (New design). Scanner: Flat bed, sheeted, Handheld: Block diagram and specifications, OCR, TWAIN, Resolution, Interpolation. Printer: Dot matrix, Inkjet, Laser: Block diagram and specifications.	12

III	Display Devices & Interfacing:- CRT color monitor: Block diagram and function of each block 3.2 Characteristics of CRT monitor: Dot pitch, Resolution, Video bandwidth. Advantages of CRT display related to LCD display. LCD monitor: functional block diagram of LCD monitor, working principal, advantages and disadvantages Types : Passive matrix and Active matrix, Important characteristics : Resolution, Refresh rate, Response time, Basic block diagram of a video accelerator care. Power Supplies:- Block diagram and working of SMPS, Power supply characteristics: Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation. Power problems: Blackout, Brownout, surges and spikes. Symptoms of power problems. Protection devices: circuit breaker, Surge suppressor: working UPS: Block diagram, working, Types, Ratings	12

DCS – 302 : PROGRAMMING IN 'C'

Credits: 4 **Semester-III**

Module No.	Contents	Teaching Hours
I	**Basics of C:-** History of C, where C stands, C character set, tokens, constants, variables, keywords, C operators (arithmetic, Logical, assignment, relational, increment, and decrement, conditional, bit wise, special, operator, precedence), C expressions data types, Formatted input, formatted output. **Decision making:-** Decision making and branching, if statement (if, if-else, else-if ladder, nested if-else), Switch case statement, break statement. Decision making and looping while, do, do-while statements for loop, continue statement	12
II	**Arrays and Strings:-** Declaration and initialization of one dimensional, two dimensional and character arrays, accessing array elements. Declaration and initialization of string variables, string handling functions from standard library (strlen (), strcpy (), strcat (),strcmp ()). **Functions:-** Need of functions, scope and lifetime of variables, defining functions, function call (call by value, call by reference), return values, storage classes. Category of function (No argument No return value, No argument with return value, argument with return value), recursion.	12
III	**Structure:-** Defining structure, declaring and accessing structure members, initialization of structure, arrays of structure. **Pointers:-** Understanding pointers, declaring and accessing pointers, Pointers arithmetic, pointers and arrays.	12

Text Books:-

1. Schaum Series, Programming in C, McGraw Hills Publishers, New York.

References Books:-

2. Yashwant Kanetkar, Exploring – BPB Publications, New Delhi.
3. Complete reference C,BY Herbert Shield, Tata Mc-Graw Hill

The C++ Programming Language by Stroustrup, Bjarne 3rd.ed. New Delhi : Pearson Education,

DCS – 303 : OPERATING SYSTEM

Credits: 4 **Semester-III**

Module No.	Contents	Teaching Hours
I	**Introduction to System Software:-** Compiler, Assembler, Loader, Operating system. Brief Introduction to MS-DOS , WINDOWS and LINUX:- Brief history of DOS and WINDOWS, Main features of DOS, Directory structure of DOS, File structure of DOS, Detail concept of DOS commands, Introduction to Windows and Linux. **Overview of Operating Systems:-** Definition, Functions, Types(Single user, Multiuser, Network, Distributed), Storage structure, I/O structure, Caching.	12
II	**Functions of Operating System:-** Process Management Functions (Principles and Brief Concept), Process Scheduler, Scheduling Criteria, Process synchronization, Deadlocks-characterization Methods for handling deadlocks, Deadlock avoidance, Deadlock prevention, Recovers from Deadlock. **Memory Management Function (Principles and Brief Concept):-** Introduction, Single Process System, Fixed Partition Memory, Paging, Segmentation, Swapping, Fragmentation, Virtual memory management, Demand paging	12
III	**I/O Management Functions (Principles and Brief Concept):-** Dedicated Devices, Shared Devices, I/o Devices, Storage Devices, Buffering, Spotting. **File Management:-** File concept, File attributes, File operations, File types, File structure, Access methods, Directory structure, Free space management	12

Text Book:

1. Milenekovie, "Operating System Concept", McGraw Hill, Delhi.
2. Petersons, "Operating Systems", Addision Wesley.
3. Dietal, "An Introduction to Operating System", Addision Wesley.
4. Tannenbaum, "Operating System Design and Implementation", PHI, Delhi.
5. Gary Nutt, "Operating System, A Modern Perspective", Addision Wesley.

References Books:

1. Stalling, Willium, "Operating System", Maxwell Macmillan.
2. Silveschatza, Peterson J, "Operating System Concepts", Willey.
3. Crowley, "Operating System", TMH, Delhi

DCS – 304 : DATABASE MANAGEMENT SYSTEM

Credits: 4 **Semester-III**

Module No.	Contents	Teaching Hours
I	**Database System Concept & Data Modeling:-** Basic concepts, Advantages of a DBMS over file processing system, Data Abstraction, Database Languages, Data Independence, Components of DBMS and overall structure of a DBMS. **Data Models:-** Network Model, Hierarchical Model, E-R Model, Client Server Architecture.	12
II	**Relational Data Model and Security and Integrity Specification:-** Relational Model: Basic concepts, attributes and domains, Keys **concept :** Candidate and primary key, Integrity constraints: Domain,Entity Integrity constraints and On delete cascade. Security and Authorization. Query Languages, Relational Algebra. **SQL:-** Introduction to SQL queries, Creating ,Inserting ,Updating and deleting tables and using constraints, Set operations & operators, Aggregate functions ,string functions and date ,time functions, Null values, sub queries, Complex queries, Join concepts. E-R Model Nested details.	12
III	**Query Processing and Transaction Processing:-** General strategies for query processing, Equivalence expressions, Selection & join operation. Concept of transaction, States of transactions, Concurrent Executions, Serializability Recoverability, Transaction. Definition in SQL. **Lock based protocols :** share & exclusive models, Protocols, 2 phase locking, Time-Stamp based, Validation based , Multiple granularity, Deadlock handling, Deadlock prevention, detection & recovery.	12

TEXT BOOKS:-

1 Database system concepts by Abraham Silberschatz, Henry F.Kroth and S. Sudharshan; th McGraw Hill Publishers, 5 Edition.

2 Fundamentals of Database Systems by Elmasri/Navathe/Adison Wesley

3 An introduction to database systems by Date C.J. Adison Wesley

4 SQL Unleashed by Hans Ladanyi Techmedia Publications, New Delhi

5 Database Management Systems by Alexis Leon and Mathews Leon; Vikas Publishing House Pvt. Ltd., New Delhi

6 Fundamentals of Database Management Systems by Dr Renu Vig and Ekta Walia, - an ISTE, Publication, New Delhi

7 Oracle 8, The complete reference by Koch and Loney, Tata McGraw Hill Publications New Delhi

DEC 304 – Basic Electronics

Credits: 4 **Semester III**

Module No.	Contents	Teaching Hours
Unit –I	**Semiconductor Physics**: Basic of Semiconductor materials and effect of temperature on semiconductor. **PN Junction Diode**:P-N junction diode with its Forward & Reverse Characteristics. Important specifications of P-N junction diode(ratings) , Break down in P-N junction, Voltage regulation **Rectifiers & Filters**: Rectifier circuit (HWR, FWR). Their comparison on the basis of circuit operation, waveforms, average (dc) value of rectifier output, ripple factor, ripple frequency, transformer utilization factor, rectification efficiency,	12
Unit – II	**Clipping & Clamping circuits**: Types and applications.Voltage Multiplier circuits: Types and applications. **Special purpose diode**: Light Emitting Diode, Liquid Crystal Display & Opt-couplers, Tunnel diode(with tunneling function),varactor diode,Schottky-Barrier diode, Zener diode, Zener diode as a voltage regulator. **Bipolar Junction Transistor (BJT):**Construction, working principle of PNP and NPN transistors, characteristics of CB, CE and CC configurations. D.C load line, Thermal stability factor. Different types of biasing methods (Fixed biasing, Collector–Base bias, Potential divider biasing,).	12
Unit - III	**Applications of BJT:** **a) Small Signal Amplifier:** Approximate hybrid model for Common Emitter Amplifier. Analysis of CE single stage Small Signal Amplifier (with un-bypassed & bypassed emitter resistor), using approximate hybrid equivalent circuit (amplifier input, output impedance, current & voltage gain). **b) Application of BJT CE inverter switch**. FETs	12

DCS – 351: COMPUTER HARDWARE AND MAINTENANCE Lab

Credits: 2 **Semester-III**

Module No.	Contents	Teaching Hours
1.	Drawing the motherboard layout of Pentium IV and studying the chipset through data books or Internet.	48
2.	CMOS setup of Pentium.	
3.	Hard Disk Partitioning.	
4.	Study of HDD: Identify various components of HDD and write their functions. Study and installation of any one display cards: VGA or SVGA display cards.	
5.	Installation of Scanner, Printers and Modems.	
6.	Study of SMPS (ATX)	
7.	Study of Diagnostic Software's. (Any one)	
8.	Fault findings:	
9.	a) Problems related to monitor. b) Problems related to CPU.	
10.	Assembling of PC and Installation of Operating System.	
11.	Configuration of Client and Server PC, Laptop and Network components.	
12.	RS232C communication between two computers.	

DCS – 352 : PROGRAMMING IN 'C' Lab

Credits: 2 **Semester-III**

LIST OF PRACTICALS

Module No.	Contents	Teaching Hours
1.	Write Programs in C to implement	48
2.	Programming Exercise on Executing and Editing a C Program.	
3.	Programming Exercise on defining Variable and assigning values to variables.	
4.	Programming Exercise on arithmetic's and relational operators.	
5.	Programming Exercise on arithmetic expression and their evaluation.	
6.	Programming Exercise on formatting input/output using printf and scanf	
7.	Programming Exercise using if-statement.	
8.	Programming Exercise using if-else statement.	
9.	Programming Exercise on switch statement	
10.	Programming Exercise on do-while statement.	
11.	Programming Exercise on for statement.	

DCS – 353 : DATABASE MANAGEMENT SYSTEM
Lab

Credits: 2 **Semester-III**

LIST OF PRACTICALS

Module No.	Contents	Teaching Hours
1.	**Study of DBMS, RDBMS.**	
2.	**To study Data Definition language Statatements.**	
3.	**To study Data Manipulation Statatements.**	
4.	**To Study of SELECT command with different clauses.**	
5.	**To Study of SINGLE ROW functions (character, numeric, Data functions).**	
6.	**To Study of GROUP functions (avg, count, max, min, Sum).**	48
7.	**To Study of various type of SET OPERATORS (Union, Intersect, Minus).**	
8.	**To Study of various type of Integrity Constraints.**	
9.	**To Study of Various type of JOINS.**	
10.	**To study Views and Indices.**	

DEC – 351 : BASIC ELECTRONICS LAB

Credits: 2 **Semester-III**

LIST OF PRACTICALS

Module No.	Contents	Teaching Hours
1.	PN Junction diode characteristics A. Forward bias B. Reverse bias.	
2.	Zener diode characteristics and voltage regulator	
3.	Half wave Rectifier with and without filter.	
4.	Full wave Rectifier with and without filter.	
5.	Full wave Bridge Rectifier with and without filter.	
6.	Transistor CB Characteristics (Input and Output)	
7.	Transistor CE characteristics (Input and Output)	
8.	Transistor CC characteristics (Input and Output)	