PEOPLE'S UNIVERSITY, BHOPAL
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Programme: **Diploma in Engineering**   **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DCS1301	**Computer Architecture**	3	1	-			Min: 40 (D Grade			**Nil**

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test-- Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Session – Max Marks: Nil	Assignment/ Quiz/Attendance Max. Marks: Nil

Pre-Requisite	**Nil**
Course Outcome	1.To understand basic structure of computer and concept of cache mapping techniques.
	2. To perform computer arithmetic operations & to design memory organization that uses banks for different word size operations.
	3.To understand control unit operations & the concept of I/O organization.

Unit	*Contents (Theory)*	Marks Weightage
I	**Data Representation And Number Systems:** Data representation Data Types and Number Systems, Binary Number System, Octal & Hexa-Decimal Number System, Fixed Point Representation, 1's & 2's Complement, Binary Fixed- Point Representation, Arithmetic Operation on Binary Numbers, Overflow & Underflow, Floating Point Representation, Codes, ASCII, EBCDIC Codes, Gray Code, Excess-3 & BCD, Error Detection & Correcting Codes Binary Storage and Registers. Motherboard And Its Components: Chipset basic, chipset Architecture: North / South Bridge architecture and Hub architecture.	**14**
II	**Boolean algebra and digital logic circuits :** Logic Gates, AND, OR, NOT Gates and their Truth Tables, NOR, NAND & XOR Gates, Boolean Algebra, Basic Definition and Properties, Basic Boolean Law's, Demorgan's Theorem. Input-output organizations- I/O Interface, Properties of simple I/O Devices and their controller, Isolated Vs Memory-mapped I/O, Modes of data transfer, Synchronous & Asynchronous data transfer.	**14**
III	**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 (No memory map), Concept of cache memory: Internal cache, External cache (L1, L2, and L3cache).	**14**
IV	**Display Devices & Interfacing:** CRT color monitor: Block diagram and function of each block, Characteristics of CRT monitor: Horizontal scanning frequency, vertical scanning frequency, and Advantages of CRT display related to LCD display, LCD monitor.	**14**
V	**Power Supplies & Interfaces:** Block diagram and working of SMPS. Signal description Power supply characteristics: Rated wattage, Efficiency, Regulation, Ripple, Power problems: Blackout, Brownout, surges and spikes, working UPS: Block diagram, working, Types.	**14**

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Text Book/References Books/ Websites
1. Morris Mano;Computer System Architecture; PHI publication ISBN 81-203-0417-9
2. Morris Mano;Digital Logic and Computer Design; TMH publication ISBN 0-07-462235-8
3. Mike Meyers ;Troubleshooting PCs; Tata McGraw Hill
4. Mark Minasi ;The Complete PC Upgrade & Maintenance Guide; BPB Publication
5. D. Balasubramanian ;Computer Installation & Servicing ;Tata McGraw Hill

Suggested List of Laboratory Experiments :- (Expandable):Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**			**Total (100)**			**Total (50)**
DCS1302	**Operating System**	3	1	1	**External (70)**	**Internal (30)**	Min: 40 (D Grade)	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/ Attendance Max. Marks: 05

Pre-Requisite	Student should have basic knowledge of computer fundamental
Course Outcome	1. To understand the services provided by and the design of an operating system.
	2. To understand the structure and organization of the file system.
	3. Students should be able to use system calls for managing processes, memory and the file system.

Unit	*Contents (Theory)*	Marks Weightage
I	**Operating system**: Introduction :An Introduction to Operating System & its Services, Various Types of Operating Systems, Operating System Structure, Concepts of: Process , Files , System Calls , Interrupt , Shell.	**14**
II	**Operating System Structures:** System components - Process management, Main memory management, File management, I/O system management, Secondary storage management. Operating system services. System calls ,Uses, process control, file management, Device management, Information ,Maintenance, communication**.** Operating system structure. Simple structure, layered, monolithic, microkernel, Booting.	**14**
III	**Process Management:** Process Concept, process, state, process, Control block. Process scheduling ,Scheduling queues, Scheduler, context switch. Operations on processes , creation, termination. Inter process communication. Threads, Benefits, user and kernel threads. Multithreading Models - Many to one, one to one, many to many.	**14**
IV	**Scheduling:** Scheduling Objectives, concept, criteria, CPU and I/O burst cycle. Types of Scheduling-Pre-emptive, Non pre- emptive. Scheduling Algorithms. First come first served (FCFS), Shortest job first (SJF), Round Robin (RR), Priority. Other Scheduling. Multilevel, Multiprocessor, real-time. Deadlock. System model, principle necessary conditions, mutual exclusion, critical region. Deadlock handling.	**14**

	Prevention and avoidance.	
V	**File- Concept:** File Management File Concepts – Types of Files – File Attributes – File Operations Access Methods: Sequential access – Random access ,Hierarchical Directory System. Memory Management Partitioned Memory Management (Static & Dynamic), Concept of Fragmentation & Compaction, Paging & Demand Paging ,Page Replacement Algorithms (FIFO, Optimal, LRU Algorithms)	**14**

Text Book/References Books/ Websites

1.Andres's Tanenbaum ;Operating System Design & Implementation ; Prentice Hall of India,

2.Stuart E Mandnick & John J Donovan Delhi Operating Systems; McGraw-Hill

3.Dhamdare;System Programming and Operating System;Tata McGraw hill .

4.Peter Galvin; Operating System concepts.

Suggested List of Laboratory Experiments :- (Expandable):

1. Study of window 2000 operating system
2. Administration of windows 2000 operating system(including dns,ldap,directory,services)
3. Study of dos operating system(with internal and external command).
4. Study of Basic commands of Linux/UNIX.
5. Write a shell script to find factorial of given number n.
6. Study of Advance commands and filters of Linux/UNIX.
7. Write a shell script to validate the entered date. (eg. Date format is : dd-mm-yyyy).
8. Write a program for process creation using C.
9. Write a shell program to find largest of three numbers.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**			**Total (100)**			**Total (50)**
DCS1303	**Data Communication**	3	1	1	**External (70)**	**Internal (30)**	Min: 40 (D Grade)	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment Quiz/ Attendance Max. Marks: 05

Pre-Requisite	1.Student should have basic knowledge of computer.
Course Outcome	2.Troubleshoot simple business network design errors.
	3.Design simple business local, metropolitan and wide area networks using appropriate architectures, hardware and security.
	4.Use data communication vocabulary appropriately when discussing issues with other networking professionals.

Unit	*Contents (Theory)*	Marks Weightage
I	**Introduction to Data Communication:** Introduction – Data Communication, Networks, Internet, Intranet, Protocols, OSI & TCP/IP Models, Physical Layer – Signals, Analog, Digital, Analog VS Digital, Transmission impairment, Transmission Media – Guided and Unguided, Digital Transmission – Line Coding (Unipolar, Polar, Biphase).	**14**
II	**Multiplexing:** FDM, WDM, Synchronous TDM (time slots & frames, interleaving, data rate management), Switched Communication Networks: Circuit, Message, Packet & Hybrid Switching, Soft switch Architecture with their comparative study.	**14**
III	**Physical Layer:** Introduction, Interface, Standards, And digital Interface: Connection, specifications & configuration, Modem: Types, features, signal constellation, block schematic, limited distance, dial up, baseband, line driver, Group Band and Null modems etc. ITU-T V-series modem standards Connecting Devices: Active and Passive Hubs, Repeaters, Bridges, Two & Three layer switches & Gateway.	**14**
IV	**Transmission Media:** Study of various types of topology and their comparative study, Transmission Media: Transmission line characteristics, distortions, Crosstalk, Guided Media: Twisted Pair, Baseband & Broadband Coaxial. Optical Fiber: Physics and velocity of propagation of light, Advantages & Disadvantages	**14**

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	Block diagram, Unguided media: Radio waves, Microwave, Infrared & Satellite Communication system.	
V	**Analog to digital conversion**: Analog to digital conversion, PCM, Transmission Modes. Analog Transmission – Digital to analog conversion (ASK, FSK, PSK, QAM), Analog to Analog conversion. Spread Spectrum – FHSS, DSSS.	**14**

Text Book/References Books/ Websites
1. Forouzan ;Data Communication & Networking ; IV Edition, TMH.
2. William Stallings ;Data & Computer Communication; Pearson Education
3. Sanjay Sharma; Data Communication and Computer Network ; S.K.Kataria and sons

Suggested List of Laboratory Experiments :- (Expandable):
1. Study of OSI Reference model.
2. Study of TCP/IP Model.
3. Study about different Physical Equipments used for Network.
4. Study of different type of Transmission media.
5. Study of LAN Using Star Topology.
6. Study of LAN using BUS Topology.
7. Study of LAN Using Tree topology.
8. Study of MODEMs.
9. TO Configure HUB/SWITCH.
10. To study of Wireless Communication.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
DCS1304	**Data Structure With C**	3	1	1	**External (70)**	**Internal (30)**	Min: 40 (D Grade)	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/ Attendance Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1.To teach efficient storage mechanisms of data for an easy access
	2.Student will be able to choose appropriate data structure as applied to specified problem definition
	3.Students will be able to apply concepts learned in various domains like DBMS, compiler construction etc.

Unit	*Contents (Theory)*	Marks Weightage
I	**Introduction to data structure :**Data Representation, data Types, Data Structure and Structured Types, Difference between Data , Data Types And Data Structures, Linear data type, Non- Linear data type, Primitive data type, and Non primitive data type	**14**
II	**Searching & Sorting:** Sorting-An Introduction, , Bubble Sort, Selection Sort, Quick Sort, Insertion Sort, Merge Sort, Heap sort, Binary Search & linear search.	**14**
III	**Stacks:** Introduction to Stacks, Push pop techniques. Array Implementation of stack, Linked representation of Stack, Application of stack. **Queues:** Introduction-Operations on queue: Searching, Insertion, Deletion. Circular Queues, Priority Queue, Application of Queues. **Linked List**: Operations on list Searching, Insertion and Deletion, Types of lists Linked list and Circular list	**14**
IV	**Trees:** Introduction to Binary Trees, Types of Trees, basic Definition of Binary Trees, Operations on Binary Search Tree, Type of Binary Tree, Operations on trees, Searching Depth-first search and Breadth-first search, Traversing Pre-order, In-order and Post-order, Insertion, Deletion. Introduction to Graphs, Terminology associated with graphs.	**14**

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V	**Introduction to C programming Fundamentals**: Data Types, User defined and standard functions, Formal and Actual arguments, Functions category, function prototypes, parameter passing, Call-by-value, Call-by-reference, Recursion, Storage Classes. Introduction to arrays and Pointers.	**14**

Text Book/References Books/ Websites
1. Puntambekar ;Data Structure Using C; Technical Publication
2. Tremblie and Sorrenson ;Data Structures ;TMH Publications
3. Seymour Lipschutz ;Data Structures;McGraw Hill Education

Suggested List of Laboratory Experiments :- (Expandable):

1. Write a program to show Array in C
2. Write a program to implement Stack using array.
3. Write a program to implement stack using linked list.
4. Write a program to implement Queue using array.
5. Write a program to implement Binary Tree.
6. Write a program to implement Binary Search Tree.
7. Write a program to implement bubble sort algorithm.
8. Write a program to implement linear search algorithm.
9. Write a program to implement Binary Search Algorithm.
10. Write a program to implement BFS and DFS Algorithm.

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		L	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
DCS1305	**Programming with C++**	3	1	1			Min: 40 (D Grade)			Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment / Quiz Max. Marks: 05

Pre-Requisite	**Nil**
Course Outcome	1.To learn the basic principles of C++ programming.
	2.Student will be able to learn advanced features of the C++ programming language as a continuation of the previous course.
	3.Students will be able to learn the characteristics of an object-oriented programming language.

Unit	*Contents (Theory)*	Marks Weightage
I	**Introduction:** Brief History of C++,Features, Structure of a C++ Program, Comments, Keywords ,Variables, Identifiers, Data types, User defined data types , Declaration of variables, Initialization of variables, Scope of variables, Constants.	**14**
II	**Operator and control structures:** Types of Operators. Priority of Operators, Control Statement**:** if-else Statement, Nested if else, Switch Statement, for Loop ,While Loop, Do-While Loop, Break Statement, Continue Statement ,Go to Statement.	**14**
III	**C++ Functions:** Types of Functions, Declaration of a function, Call by value and call by reference, Recursion, Static Member functions, Storage Classes ,C++ Arrays, Types, Passing Array to Function, Pointers.	**14**
IV	**Object& Class:** Introduction to class, Class Definition, Classes and Objects, Access specifiers – Private, Public and Protected. Member functions of the class. OOPs Concepts, Constructor, Default Constructor, Parameterized Constructor, Copy Constructor, Destructor, this Pointer, static keyword, Enumeration, Friend Function	**14**
V	**C++ Inheritance**: Types of Inheritance, Aggregation, C++ Polymorphism: Compile time vs Run time polymorphism, Function Overloading, Operators Overloading, Function Overriding, virtual function, Pure Virtual Function Abstract class , C++ Strings, C++ Files and Streams, C++ Templates, Exception handling.	**14**

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Text Book/References Books/ Websites
1. Herbert Schildt; C++, The Complete Reference; TMH
2. S.B.Lippman and J.Lajoie; C++ Primer; Pearson Education
3. ,B.Stroutstrup; The C++ Programming Language; Pearson Education

Suggested List of Laboratory Experiments :- (Expandable):

1. Write a program in C++ to search the largest element in an array.
2. Write a program in C++ to search the smallest element in an array.
3. Write a program in C++ to exchange the content of two variables using call by reference
4. Write a program in C++ to demonstrate the Constructor Overloading, assume desired parameters.
5. Write a program in C++ to create the class shape, and overload the function to return the perimeters of the different shapes.
6. Write a program in C++ demonstrating the public, protected and private parameters.
7. Write a program in C++ using inheritance.
8. Write a program in C++ to demonstrate multiple inheritances.
9. Write a program in C++ to create a file. (Assume suitable data)
10. Write a program in C++ to demonstrate virtual function.
11. Write a program in C++ to demonstrate friend function.
12. Write a program to implement a Class Matrix that adds subtracts and initializes the matrix.
13. Write a C++ program to implement a student class having roll no, name, rank, and addresses as data members.
14. Write a C + + program to implement matrix class. Add member function to transpose the matrix.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total	External (35)	Internal (15)	Total (50)
DCS1306	**Hardware Lab**	-	-	1			Nil			Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance Max. Marks: 05

Pre-Requisite	To identify the parts of computer system
Course Outcome	To Understand installation of parts of computer.

Unit	*Contents (Theory)*	Marks Weightage
I	**Motherboard And Its Components** :Overview and features of ISA, PCI-X, PCI-X press, AGP, PCMCIA, AGP ,Processor BUS (no pin description) PCI versus PCI Express, Logical memory organization: Conventional memory, Extended memory, Extended memory, upper memory (No memory map),Concept of cache memory : Internal cache, External cache (L1, L2, L3cache)	**50**
II	**Storage Devices And Its Interfacing:** Recording Technique: FM, MFM, RLL Perpendicular magnetic recording, Hard disk construction and working Servos Techniques : Wedge servo, Embedded servo, dedicated servo.	
III	**Terms related to Hard Disk** : Track, Sector cylinder, cluster, landing zone, MBR, Zone recording, write re 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 cables	

Text Book/References Books/ Websites:- Nil

Suggested List of Laboratory Experiments :- (Expandable):
1. Study of Motherboard and CPU
2. Study of Front panel indicators & switches and Front side & rear side Connectors.
3. Familiarize the computer system Layout: Marking positions of SMPS, Motherboard, FDD, HDD, CD, DVD and add on cards..
4. Install Hard Disk and configure to the Pc's.
5. Load testing of SMPS.
6. Identifying external Ports and Interfacing.
7. Installation of Printer and scanner.
8. Install and Configure Dual OS Installation.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total	External (Nil)	Internal (50)	Total (50)
DPE1307	Professional Skill	-	-	1			Nil			Min: 20 (D Grade)

Duration of Theory (Externals): -

Theory Internal- Max Marks: -Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance Max. Marks: Nil
Practical Internal Max Marks: 50	Lab work & Sessional – Max Marks: -Nil	Assignment/Quiz/ Attendance Max. Marks: 50

Pre-Requisite	**Nil**
Course Outcome	To develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team. To enhance capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems.

Unit	*Contents (Theory)*	Marks Weightage
I	**Quantitative Aptitude:** Percentages/Profit & Loss, Time and Work, Simple and Compound Interest, Series and Progression.	
II	**Reasoning :** Puzzles and Seating Arrangement, Data Sufficiency, Coding-decoding, Blood Relation, Order and Ranking, Alpha Numeric Symbol Series, Logical Reasoning:	**50**
III	**English**: free quizzes related to Synonyms, Antonyms, One Word Substitution, Idioms and Phrases, Spelling Correction; Fill in the Blanks and Common Errors in English.	

Text Book/References Books/ Websites

1. R.S. Aggarwal; Quantitative Aptitude for Competitive Examinations.
2. Arihant Publications; Fast Track Objective Arithmetic.
3. R S Aggarwal; Verbal and Nonverbal Reasoning.
4. M K Pandey; Analytical Reasoning.
5. B S Sijwali, Indu Sijwal; A New Approach to Reasoning Verbal and Non-Verbal (English) 1st Edition.
6. SP Bakshi; Objective General English.
7. Wren and martin; English grammar book.

Suggested List of Laboratory Experiments :- (Expandable):

Students should solve various problems and quiz on the above mention topics, and prepare an assignment.