

**GOVERNMENT POLYTECHNIC, PUNE**  
**(An Autonomous Institute of Govt. of Maharashtra)**

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**Programme** : Diploma in CM/IT  
**Programme Code** : 06/07  
**Name of Course** : Operating System  
**Course Code** : CM461

**Teaching Scheme:**

	Hours /Week	Total Hours
<b>Theory</b>	<b>04</b>	<b>64</b>
<b>Practical</b>	<b>02</b>	<b>32</b>

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

**Course Rationale:**

Operating Systems are system programs, which are very essential components of Computer system. This course is aimed to teach and practice the concept of Operating System design.

**Course Objectives:**

After studying this course, the student will be able to

- Use operating system effectively
- Understand overall issues in Operating System design
- Understand a process, deadlock & the concept of context switching & multiprogramming
- Learn various memory management and file management techniques.
- Implement various algorithms of scheduling
- Understand different File Systems

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**Course Content:**

Chapter No.	Name of Topic/Sub topic		Hrs	Weight age
1	Introduction			
	1.1	What Operating Systems Do, Computer-System Organization, Computer-System Architecture, Operating-System Structure	04	06
	1.2	Operating-System Operations, Process Management, Memory Management, Storage Management, Protection and Security, Distributed Systems		
	1.3	Special-Purpose Systems, Computing Environments, Open-Source Operating Systems.		
2	Operating-System Structures			
	2.1	Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls	10	15
	2.2	System Programs, Operating-System Design and Implementation		
	2.3	Operating-System Structure, Virtual Machines, Operating-System Debugging		
	2.4	Operating-System Generation, System Boot.		
3	Processes and Thread			
	3.1	Process Concept, Process Scheduling, Operations on Processes	10	12
	3.2	Inter process Communication, Examples of IPC Systems		
	3.3	Communication in Client-Server Systems, Multithreading Models		
	3.4	Thread Libraries, Threading Issues, Operating-System Examples.		
4	CPU Scheduling and Process Synchronization			
	4.1	Basic Concepts, Scheduling Criteria. Scheduling Algorithms	06	07
	4.2	Thread Scheduling, Multiple-Processor Scheduling		
	4.3	Operating System Examples, Algorithm Evaluation, The Critical-Section Problem		

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	4.4	Peterson’s Solution, Synchronization Hardware		
	4.5	Semaphores		
	4.6	Classic Problems of Synchronization, Monitors, Synchronization Examples, Atomic Transactions.		
5	Deadlocks.			
	5.1	System Model, Deadlock Characterization	10	10
	5.2	Methods for Handling Deadlocks		
	5.3	Deadlock Prevention, Deadlock Avoidance		
	5.4	Deadlock Detection, Recovery from Deadlock		
6	Memory Management			
	6.1	Main Memory: Background	10	10
	6.2	Swapping, Contiguous Memory Allocation		
	6.3	Paging, Structure of the Page Table		
	6.4	Segmentation Example: The Intel Pentium		
	6.5	Virtual Memory : Background, Demand Paging, Copy on Write, Page Replacement Allocation of frames, Trashing.		
	6.6	Memory Mapped Files, Allocating Kernel Memory, Other Considerations, Operating-System Examples		
7	Storage Management			
	7.1	File-System Interface: File Concept, Access Methods, Directory and Disk Structure, File-System Mounting, File Sharing, Protection	08	10
	7.2	File-System Implementation: File-System Structure, File-System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance, Recovery, NFS, Example: The WAFL File System		
	7.3	Mass-Storage Structure: Overview of Mass-Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap-Space Management, RAID Structure, Stable-Storage Implementation, Tertiary-Storage Structure.		

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<b>8</b>	<b>Security &amp; Protection</b>			
	8.1	Protection: Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix, Implementation of Access Matrix, Access Control	<b>06</b>	<b>10</b>
	8.2	Revocation of Access Rights, Capability-Based Systems, Language-Based Protection		
	8.3	Security: The Security Problem, Program Threats, System and Network Threats, Cryptography as a Security Tool, User Authentication		
	8.4	Implementing Security Defenses, Firewalling to Protect Systems and Networks, Computer-Security Classifications, Example: Windows XP		
<b>Total</b>			<b>64</b>	<b>80</b>

**List of Practicals/Experiments/Assignments:**

<b>Sr. No.</b>	<b>Name of Experiment/Assignment</b>	<b>Hrs</b>
1	Study of the various Operating System i) DOS ii) Windows 9x, Windows NT, Windows 2000 & Windows XP, Exploring Windows 2003 iii) LINUX.	04
2	Study of Hard disk i) Partition creation ii) Share disk iii) Create dual-boot system	04
3	Write a Program in C for calculation of CPU utilization time like Process Time, Waiting Time, Burst Time etc.	02
4	Write a program in C for FCFS Process Scheduling Algorithm	02
5	Write a Program in C for SJF process scheduling algorithm	02
6	Write a Program in C for Round Robin scheduling algorithm.	02
7	Write a program in C using interrupt to <b>clear the screen.</b>	02
8	Write a program in C using interrupt to move the BOX on the screen using arrow key.	02

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9	Write a Program in C using Interrupt to keep CAPS LOCK off	02
10	Practical based on File Operations(Using C) i) Write a program to copy a file. ii) Write a program to delete a file. iii) Write a program to rename a file. iv) Write a program to count number of files in given directory.	06
11	Demonstration based on different File Systems	02
	Case Studies : i) System call Users View of PC- DOS ii) PC-DOS implementation	02
<b>Total</b>		<b>32</b>

**Instructional Strategy:**

Sr. No.	Topic	Instructional Strategy
1	Introduction	Explanation of basic concept
2	Operating-System Structures	Explanation Structure of Operating System
3	Processes and Thread	Explanation of Process concepts
4	CPU Scheduling and Process Synchronization	Explanation & Practical implementation of algorithm
5	Deadlocks	Explain concept & principle
6	Memory Management	Explain concept & principle
7	Storage Management	Explanation of concept & practical implementation of storage Management.
8	Security & Protection	Explanation of concept & policies.

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**Text Books:**

Sr. No	Author	Title	Publication
1	Silberschatz Galvin, Gagne	Operating System Concepts	John Wisley & Sons

**Reference Books:**

Sr. No	Author	Title	Publication
1	Achyut S. Godbole	Operating Systems	Tata McGraw-Hill
2	D. M. Dhamdhare	System Programming & Operating System	TMH
3	Kamin Jonathan	DOS 6 & 6.2	Galgotia Publication
4	Peterson	Operating System	
5	Milan Milenkovic	Operating System Concept & Design	TMH
6	Andrew S. Tanenbaum	Modern Operating Systems	Prentice Hall of India

**Learning Resources:** LCD, White board

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**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction	02	01	03	06
2	Operating-System Structures	04	04	07	15
3	Processes and Thread	06	03	03	12
4	CPU Scheduling and Process Synchronization	04	02	01	07
5	Deadlocks	03	05	02	10
6	Memory Management	03	05	02	10
7	Storage Management	03	05	02	10
8	Security & Protection	03	05	02	10
Total		28	30	22	80



(Prof. R.T.Nemade )  
Prepared By



(Prof. S. B. Kulkarni)  
Secretary, PBOS



(Prof. S.B.Nikam )  
Chairman, PBOS

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**Programme** : Diploma in Computer Engineering.  
**Programme Code** : 06  
**Name of Course** : Microprocessor Fundamental Programming & Applications.  
**Course Code** : CM462

**Teaching Scheme:**

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests of 60Min. duration	3 hrs.	---	---	---
Marks	20	80	25	--	25

**Course Rational:**

Microprocessor is challenging field, to meet challenges of growing advanced microprocessor technology. It is necessary for computer engineering to know the architecture and behavior of processors in order to become efficient programmer. The course aims in providing the knowledge of 8085/8086 processors to the students since they are the foundation of Intel processor family.

**Course Objectives:**

After studying this course, the student will be able to

- Draw the architecture of microprocessor 8085/86/88.
- Write program in proper format.
- Understand conditional, loop & jumping rotate, compare etc.
- Write Instructions .
- Understand instruction to setup time delay.



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- Understand and use of stack, subroutine and interrupts.
- The student is expected to know assembler tool.
- To understand the assembly language programming student must be familiar with instruction set of 8086.
- Understand various instructions & instructions cycle, working of data and address buses.

**Course Content:**

Chapter No.	Name of Topic/Sub topic		Hrs	Weight age
1	Microprocessor, Microprocessor Architecture & Microcomputer Systems.			
	1.1	Introduction	10	08
	1.2	Microprocessor architecture & its Operations.		
	1.3	Memory		
	1.4	I/O Devices		
	1.5	8085 MPU		
	1.6	Example of 8085 based microcomputer.		
2	8085 Instructions & Timing			
	2.1	Classification of instruction	06	10
	2.2	Instruction format		
	2.3	How to write & execute 8085 program		
	2.4	8085 instruction set & Instruction timing		
3	8085 Programming			
	3.1	Basic instruction of 8085	10	12
	3.2	All instructions of 8085 like		
	3.3	Data transfer, Arithmetic Operations, Branch, Debugging Programs, etc.		
4	Additional Instructions, Stack, Subroutines, Interrupt			
	4.1	Looping, indexing, counting.	06	10
	4.2	16-bit arithmetic logic operations		
	4.3	Rotate, Compare instructions		
	4.4	Stack and its operations		
	4.5	Subroutine & 8085 interrupts		

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5	8086/8088 Architecture			
	5.1	Introduction	07	08
	5.2	Internal Architecture, Pins & Signals.		
	5.3	Addressing Modes.		
	5.4	Instruction Formation.		
6	Instruction Set			
	6.1	Data transfer and arithmetic instructions	10	12
	6.2	Branched instructions: conditional, unconditional ,looping		
	6.3	NOP, HLT instructions		
	6.4	Flag manipulation instructions and Assembler directives		
	6.5	Data address and Naming directives		
	6.6	ASM86 Pseudo-instructions.		
7	Assembly Language Programming			
	7.1	Program Format	10	12
	7.2	How to write programs for use with assembler		
	7.3	Writing & using procedures & macros.		
8	Interfacing and Introduction to Pentium			
	8.1	Multiprocessing configuration of 8086 with IOP 8089 & ND 8087.	05	08
	8.2	Features of 80286, 386,486		
	8.3	Intel 80486 – MIPS, RISC V/S.CISC.		
	8.4	Introduction of Pentium.		
Total			64	80

**List of Practicals/Experiments/Assignments:**

<b>Sr. No.</b>	<b>Name of Experiment/Assignment</b>	<b>Hrs</b>
1	<ul style="list-style-type: none"> <li>Monitor the contents of various segments and registers on 8085 kit or using debug utility.</li> </ul>	04
2	<ul style="list-style-type: none"> <li>Addition of 8 bit numbers with carry.</li> <li>Addition of 8 bit number without carry.</li> </ul>	08

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3	<ul style="list-style-type: none"> <li>Subtraction of 8 bit number with carry.</li> <li>Subtraction of 8 bit number without carry.</li> </ul>	
4	<ul style="list-style-type: none"> <li>Multiplication of two numbers.</li> <li>Transfer the block of data from one place to another.</li> </ul>	
5	<ul style="list-style-type: none"> <li>Find the smallest number of series.</li> <li>Find the greatest number of series.</li> </ul>	10
6	<ul style="list-style-type: none"> <li>Arrange the given numbers in ascending order.</li> <li>Arrange the given numbers in descending order.</li> <li>Transfer the block of data in reverse order from one place to another place.</li> </ul>	
7	Assembly Language Programming with ASM86 <ul style="list-style-type: none"> <li>Write a program to add/sub two 16-bit binary numbers.</li> <li>Write a program to multiply two numbers.</li> <li>Write a program to convert Hex. Number into Equivalent decimal.</li> </ul>	10
8	<ul style="list-style-type: none"> <li>Write a program to convert decimal 0 to 255 into Hex.</li> <li>Write a program to generate Prime no. from 0 to 100.</li> <li>Write a program for matrix addition.</li> <li>Write a program to perform logical operations on 16-bit data.</li> </ul>	
<b>Total</b>		<b>32</b>

**Instructional Strategy:**

Sr. No.	Topic	Instructional Strategy
1	Microprocessor, Microprocessor Architecture & Microcomputer Systems.	Explanation of Introduction, architecture
2	8085 Instructions & Timing	Explanation of Instruction format & demonstration of execution of simple program.
3	8085 Programming	Writing 8085 based programs & hands on experience with it.
4	Additional Instructions, Stack, Subroutines, Interrupt	Exercising detail programming

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6	8086/8088 Architecture	Explanation of 8086/8088 arch.
7	Instruction Set	Explanation
8	Assembly Language Programming	Writing 8086 based programs & hands on experience with it.
9	Interfacing and Introduction to Pentium	Explanation

**Text Books:**

Sr. No	Author	Title	Publication
1	Awate S.P.	8085 Microprocessor Assembly language Programming & Applications	McGraw Hill
2	Ramesh Gaonkar	Microprocessor Architecture, Programming & Applications with the 8085	Penram International Publishing (India) (Third Edition)
3	B.Ram	Microprocessor programming (8085)	
4	Liu –Gibson	Microprocessor systems 8086/88 family	Prentice Hall of India
5	Douglass Hall	Microprocessor & Interfacing	Tata -McGraw Hill

**Guideline for conducting practical examination :** For performing practicals following tools can be used depending on availability: available kits, assembler, debug utility or simulator.


**Learning Resources:** Books, LCD, White board.

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**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	$\mu$ P, $\mu$ P Architecture & Microcomputer Systems	04	02	02	08
2.	8085 Instructions & Timing	05	03	02	10
3.	8085 Programming	03	03	06	12
4.	Additional Instructions, Stack, Subroutines, Interrupt	02	03	05	10
5.	8086/8088 Architecture	04	02	02	08
6.	Instruction Set	06	03	03	12
7.	Assembly Language Programming	03	03	06	12
8.	Interfacing and Introduction to Pentium	02	02	04	08
Total		29	21	30	80

  
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**Programme** : Diploma in Computer Engineering/ Information Technology  
**Programme Code** : 06 / 07  
**Name of Course** : Computer Graphics  
**Course Code** : CM463

**Teaching Scheme:**

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	25	--	25

**Course Rationale:**

Today's graphics oriented PCs require that students explore and understand a dazzling array of graphics techniques and technologies. Graphics under 'C' details the fundamentals of graphics programming for the IBMPC and compatibles, teaching 'C' programmers of all levels how to create impressive graphics easily and efficiently.

**Course Objectives:**

After studying this course, the student will be able to

- Understand the basics of graphics programming.
- Write programs for creating various shapes.
- Write programs for processing various shaped objects.
- Create a 3D picture.
- Develop graphical interface using minimum available tools for specific needs.

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**Course Content:**

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
<b>1</b>	<b>Graphics Systems</b>		
	1.1 Video Display Devices	10	10
	1.2 Raster Scan Systems		
	1.3 Input devices		
	1.4 Graphics Software		
	1.5 Coordinate representations		
	1.6 Graphics Functions & Standards		
<b>2</b>	<b>Raster Scan Graphics</b>		
	2.1 Line Drawing Algorithms	16	20
	2.2 Digital Differential Analyzer		
	2.3 Bresenham's Algorithm		
	2.4 Circle Generation- Bresenham's Algorithm		
	2.5 Scan conversion		
	2.6 Generation of the Display		
	2.7 Frame Buffers		
	2.8 Line Display, Character Display		
	2.9 Polygon Filling : Seed fill algorithms: Flood fill, Boundry fill, scanline algorithms		
	2.10 Fundamentals of Antialiasing		
<b>3</b>	<b>Two-Dimensional Transformations</b>		
	3.1 Basic Transformations: Translation Scaling, Rotation	12	18
	3.2 Matrix representations & homogeneous coordinates		
	3.3 Composite Transformations-Scaling relative to a fixed pivot, rotation about a pivot point		
	3.4 Other transformations		
<b>4</b>	<b>Windowing &amp; Clipping Techniques</b>		
	4.1 Windowing concepts	12	16
	4.2 Clipping algorithms		
	4.3 Area clipping		
	4.4 Line clipping: Cohen Sutherland clipping algorithm, Cyrusbeck, Liang Barsky, Mid point subdivision		
	4.5 Polygon clipping: Sutherland Hodgeman		
	4.6 Text clipping		
	4.7 Window to-viewport transformation		

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5	Three Dimensional Graphics			
	5.1	Three dimensional transformation	08	10
	5.2	Hidden line elimination & hidden surface elimination (back face removal, z-buffer, painters algorithm and Warnocks algos)		
	5.3	Bezier and B-Spline curves:		
6	Perspective and Parallel Transformation			
	6.1	Types of Perspective and Parallel projection	06	06
	6.2	Vanishing points		
Total			64	80

**List of Practicals/Experiments/Assignments:**

<b>Sr. No.</b>	<b>Name of Experiment/Assignment</b>	<b>Hrs</b>
1	Study of Video Display Devices.	02
2	Programs for displaying the point on the screen, graphics demonstration program. Programs for drawing: Lines, circles and ellipse. Programs for drawing and 06filling polygon.	08
3	Programs for two-dimensional translation, scaling, rotation & reflection.	06
4	Program for point clipping, line clipping and polygon clipping.	08
5	Programs for drawing 3-D figures. Programs for drawing Bezier and B-Spline curves.	06
6	Study of parallel and perspective transformation	02
<b>Total</b>		<b>32</b>



**Instructional Strategy:**

Sr. No.	Topic	Instructional Strategy
1	Graphics Systems	Explanation and Case study
2	Raster Scan Systems	Explanation, Case study and Implementation
3	Two Dimensional transformation	Explanation, Case study and Implementation
4	Windowing & Clipping Techniques	Explanation, Case study and Implementation
5	Three Dimensional Graphics	Explanation, Case study and Implementation
6	Perspective and Parallel Transformation	Explanation and Case study

**Text Books:**

Sr. No	Author	Title	Publication
1	Donald Hearn and M Pauline Baker	Computer Graphics	Prentice-Hall
2	David F. Rogers	Procedural Elements for Computer Graphics	McGraw-Hill

**Reference Books:**

Sr. No	Author	Title	Publication
1	William M. Newman Robert F. Sproull	Principles of Interactive Computer Graphics	McGraw-Hill
2	Zhigang Xiang Roy Plastock	Computer Graphics	Schaum O Series

**Learning Resources:** OHP, LCD, Projector, and Transference, White board

**Web Sites:**


- <http://www.rspa.com>
- <http://www.doc.ic.ac.uk/~dfg/graphics>


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**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Graphics Systems	05	00	05	10
2	Raster Scan Systems	05	05	10	20
3	Two Dimensional transformation	04	04	10	18
4	Windowing & Clipping Techniques	05	05	06	16
5	Three Dimensional Graphics	04	02	04	10
6	Perspective and Parallel Transformation	02	02	02	06
Total		25	18	37	80

  
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**Programme** : Diploma in Computer Engineering  
**Programme Code** : 06  
**Name of Course** : Computer Peripherals & Hardware Maintenance  
**Course Code** : CM 464

**Teaching Scheme:**

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

**Course Rationale:**

The PC Compatible Microcomputer family is rapidly moving forward in power & capabilities. This Course introduces students regarding architecture, tools, and equipments of system and also upgrades & repair the system. This course introduces different peripheral devices and interfacing cards.

**Course Objectives:**

After studying this course, the student will be able to

- Understanding basic hardware of computer
- Install all necessary device drivers and setup of system configuration
- Identify systems hardware & related faults.
- Understand various techniques of interfacing and Use serial/ parallel port.
- Understand working of various power supply.

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**Course Content:**

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
<b>1</b>	<b>Motherboard And Its Components:</b>		
	1.1 Chipset basic, chipset Architecture, North / South Bridge architecture and Hub architecture.	<b>20</b>	<b>20</b>
	1.2 support chips on motherboard, 8288,8284,8259,8237,8253		
	1.3 Motherboard Logics, Reset logic, DMA logic, Wait state logic, Bus arbitration logic, RAM logic, NMI logic, Dynamic Memory, Refresh logic, Keyboard logic.		
	1.4 Overview and features of ISA,PCI-X, PCI-Xpress, AGP,PCMCIA, AGP, Processor BUS		
	1.5 Logical memory organization: Conventional memory, Extended memory, Extended memory, upper memory Concept of cache memory : Internal cache, External cache (L1, L2,L3),Overview and features of RAM,DRAM,SIMM,RIMM,DIMM, DDR, DDR2, DDR3		
	1.6 CMOS setup- standard CMOS setup, Advanced CMOS setup.		
<b>2</b>	<b>Storage Devices And Its Interfacing</b>		
	2.1 Recording Technique : FM, MFM, RLL Perpendicular magnetic recording	<b>10</b>	<b>16</b>
	2.2 Hard disk construction and working		
	2.3 Terms related to Hard Disk : Track, Sector cylinder, cluster, landing zone, MBR, Zone recording, write pre-compensation		
	2.4 FAT basics, Introduction to file system FAT 16, FAT 32, NTFS		
	2.5 Hard disk drive interface : features of parallel AT attachment (PATA), Serial ATA (SATA)		
	2.6 Hard disk controller Working.		

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<b>3</b>	<b>Input &amp; Output Devices</b>			
	3.1	Keyboard Construction, Types of key-switches Membrane, Mechanical, Capacitive	<b>12</b>	<b>16</b>
	3.2	Mouse Construction: Mechanical, Opto-mechanical, optical		
	3.3	Scanner : Flat bed, Handheld scanner & Construction.		
	3.4	Modem : Internal and External modem , Block diagram and specifications.		
	3.5	Printer : Dot matrix, Inkjet, Laser Construction and working.		
	3.6	CRT colour monitor : Block diagram and function of each block, Characteristics of CRT monitor : Dot pitch, Resolution, Video bandwidth, Horizontal scanning . frequency, vertical scanning frequency, Interlaced, non-interlaced		
	3.7	LCD monitor : functional block diagram of LCD monitor, working principal.		
	3.8	Introduction to Barcoding and Barcode Readers.		
<b>4</b>	<b>PC Power Supplies</b>			
	4.1	Block diagram and working of SMPS	<b>08</b>	<b>08</b>
	4.2	Signal description and pin diagram of AT and ATX connectors.		
	4.3	Power supply characteristics : Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation.		
	4.4	Power problems : Blackout, Brownout, surges and spikes.		
	4.5	UPS : Block diagram, working, Types, Ratings.		
<b>5</b>	<b>Interfaces</b>			
	5.1	SCSI, SCSI cables and connectors ,USB features.	<b>06</b>	<b>10</b>
	5.2	RS232 (voltages and 9 pin description), Centronics interface and signals.		
	5.3	Firewire features and Infrared features		

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6	PC Troubleshooting, Maintenance and Tools			
	6.1	Preventive Maintenance : Active, Passive, periodic maintenance procedure.	08	10
	6.2	Preventive maintenance of peripherals		
	6.3	ESD (Electrostatic discharge), RFI protection, Earthing and isolation		
	6.4	Working of logic probe, logic pulser, current tracer, logic analyzer		
Total			64	80

**List of Practicals/Experiments/Assignments:**

Sr. No.	Name of Experiment/Assignment	Hrs
1.	Installation of mother – board. And Study of motherboard layout.	02
2.	Study of CMOS setup	02
3.	Study of POST and various system beeps.	02
4.	Study of HDD: Identify various components of HDD and write their functions.	02
5.	Hard Disk formatting and partitioning	04
6.	Study and installation of any one display cards: VGA or SVGA display cards.	02
7.	Installation of Scanner, Printers and Modems	04
8.	Study of SMPS and Study of UPS: i) off line UPS ii) on line UPS	04
9.	Study of i) RS232C ii) Centronics interface	04
10.	Study of Diagnostic Software's.	02
11.	Fault findings: (a) Problems related to monitor. (b) Problems related to CPU. (c) Problems related to keyboard & mouse (d) Problems related to Printer	04
Total		32

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**Instructional Strategy:**

Sr. No.	Topic	Instructional Strategy
1	Motherboard and Its Components	Explanation and installation of motherboard and its components.
2	Storage Devices And Its Interfacing	Explanation and Demonstration of storage devices and its interfacing.
3	Input & Output Devices	Explanation, Demonstration & installation of input output devices.
4	Power Supplies	Explanation and Demonstration of power supplies
5	Interfaces	Explain working of various interfaces.
6	Pc Troubleshooting, Maintenance and Tools	1) Explanation of various troubleshooting tools and preventive maintenance. 2) Demonstration of various fault related to peripherals.

**Reference Books:**


Sr. No	Author	Title	Publication
1	Govindrajalu B.	<b>IBM PC &amp; Clones</b>	Tata McGraw Hill(Second Edition)
2	Scott Mueller	Upgrading & Repairing PC's	Prentice Hall of India(Eighth Edition)
3	Subhadeep Choudhury	A to Z of PC Hardware & Maintenance	Dhanpat Rai & Co.
4	Mark Minasi	The Complete PC Upgrade & maintenance Guide	BPB Publication
5	Bigelow	Troubleshooting, Maintaining & Repairing PCs	Tata McGraw Hill


**Learning Resources:** OHP, LCD, Projector, and Transference, White board.


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**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Motherboard And Its Components	10	04	06	20
2.	Storage Devices And Its Interfacing	10	02	04	16
3.	Input & Output Devices	07	03	06	16
4.	Power Supplies	03	02	03	08
5.	Interfaces	04	02	04	10
6.	Pc Troubleshooting, Maintenance and Tools	03	02	05	10
Total		37	15	28	80

  
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H.S.Chaudhari )  
Prepared By

  
(Prof. S. B.  
Kulkarni)  
Secretary, PBOS

  
(Prof. S.B.Nikam )  
Chairman, PBOS



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**Programme** : Diploma in Computer Engg /Information Technology  
**Programme Code** : 06/ 07  
**Name of Course** : Relational Database Management System  
**Course Code** : CM465

**Teaching Scheme:**

	Hours /Week	Total Hours
Theory	04	64
Practical	04	64

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	25	--	25

**Course Rationale:**

The major objectives of this course is to provide a strong formal foundation in Database Concepts, technology and practice to the students to enhance them into well informed application developers. After learning this subject, the students will be able to understand the designing of RDBMS and can use any RDBMS package as a backend for developing database applications.

**Course Objectives:**

After studying this course, the student will be able to

- Create Normalized Database structure files.
- Perform all relational database data related operations like, insert, update, delete.
- Write Logical and Conditional statement for Database Query.
- Write PL/SQL block of code.
- Write procedures and functions.
- Create and use Triggers.
- Import and Export Data.

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**Course Content:**

Chapter No.	Name of Topic/Sub topic	Hrs	Weightage
<b>1</b>	<b>Introduction to Database system</b>		
	1.1 <b>Basic Database concepts:</b> Data, database, Database system, DBMS, Types of DBMS, and Drawbacks of file system, data abstraction, Data independence, Characteristics of a Relational DBMS model, The 12 Rules (Codd's laws) for fully functional RDBMS.	<b>04</b>	<b>10</b>
	1.2 <b>Architecture:</b> Overall architecture of DBMS, Three level architecture.		
	1.3 <b>Data Models:</b> Three classical Data Models-Hierarchical, Networking, Relational Data Models.		
	1.4 <b>Advanced Concepts:</b> Introduction to Data warehousing and data mining, Multimedia Databases.		
<b>2</b>	<b>Relational Data Model</b>		
	2.1 <b>Relational Structure-</b> Tables (Relations), Rows (Tuples), Domains, attributes, extension, Intention.	<b>08</b>	<b>12</b>
	2.2 <b>Keys:</b> Candidate Keys, Primary Keys, Foreign Keys, Super Keys, Unique Keys.		
	2.3 <b>Data Constraints:</b> Referential Integrity Constraints, Entity Integrity Constraints, Constraints like Primary key constraint, Unique, Check constraint strong Entity, weak Entity.		
	2.4 <b>Database Design:</b> Relational database Design, Normalization based on functional dependencies, Normal forms: 1NF, 2NF, 3NF, BCNF.		
	2.5 <b>Conceptual Design:</b> Entity Relationship Model, E-R Diagrams.		
<b>3</b>	<b>Interactive SQL</b>		
	3.1 <b>SQL:</b> Invoking SQL*PLUS, The Oracle Data-types, Data Definition Language (DDL), Data Manipulation language (DML), data control language (DCL) and all related commands.	<b>14</b>	<b>15</b>

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	3.2	<b>Queries using Group by and Order by clause &amp; Join:</b> Querying a Single Table, Ordering results, Grouping the results, Joins, Types of Joins, Sub queries.		
	3.3	<b>Operators:</b> Logical, Value, Syntax and Query expression operators. Set operators.		
	3.4	<b>Functions:</b> Character, Arithmetic, Date and time, Group and Miscellaneous Functions.		
	3.5	<b>Format models:</b> Character, Numeric & Date Format models.		
<b>4</b>	<b>SQL Performance Tuning</b>			
	4.1	<b>Views:</b> What are Views? The Create View Command, Updating Views, Views and Joins, Views and Sub queries, What Views cannot do? , Dropping Views.	<b>08</b>	<b>13</b>
	4.2	<b>Sequences:</b> Creating Sequences, Altering Sequences, Dropping Sequences.		
	4.3	<b>Indexes:</b> Index Types, Creating of an Index: Simple Unique, and Composite Index, Dropping Indexes.		
	4.4	<b>Snapshots:</b> Creating a Snapshot, Altering Snapshot, Dropping a Snapshot.		
<b>5</b>	<b>PL/SQL</b>			
	5.1	Introduction of PL/SQL: The PL/SQL Syntax, The PL/SQL Block Structure, Fundamentals of PL/SQL, Advantages of PL/SQL data Types.	<b>10</b>	<b>10</b>
	5.2	Control Structure: Conditional Control, Iterative Control, Sequential Control.		
	5.3	Exception handling: Predefined Exception, User defined Exception.		
	5.4	Cursors: Implicit and Explicit Cursors, Declaring, Opening and Closing a Cursor, Fetching a Record from Cursor, Cursor for loops, Parameterized Cursors.		
<b>6</b>	<b>PL/SQL Database Objects and Oracle Utilities</b>			
	6.1	<b>Procedures:</b> Advantages, Creating, Executing and Deleting a Stored Procedure.	<b>20</b>	<b>20</b>
	6.2	<b>Functions:</b> Advantages, Creating, Executing and Deleting a Function.		

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	6.3	<b>Database Triggers:</b> Use of Database Triggers, How to apply database Triggers, Types of Triggers, Syntax for Creating Trigger, Deleting Trigger.		
	6.4	<b>Oracle Utilities:</b> Exporting Oracle database information, Importing Oracle database information, ODL & SQL*Loader.		
<b>Total</b>			<b>64</b>	<b>80</b>

**List of Practicals / Experiments/Assignments:**

Sr. No.	Name of Experiment/Assignment	Hrs
1	<ul style="list-style-type: none"> <li>Assignments based on Codd's Rules and data models.</li> <li>Study of Overall architecture and three level architecture of DBMS.</li> </ul>	02
2	<ul style="list-style-type: none"> <li>Designing a Normalized Database.</li> <li>Designing E-R diagrams.</li> </ul>	08
3	<ul style="list-style-type: none"> <li>Creating a Table, Inserting Data into Tables, Updating Contents of a Table, Delete Operations, Modifying the Structure of the Table, Renaming the table, Dropping Tables.</li> <li>Applying Constraints such as Primary key, not null, Foreign key, Check, default etc.</li> <li>Writing Queries using various operators, Functions &amp; Format models.</li> </ul>	18
4	<ul style="list-style-type: none"> <li>Writing Queries using the Select Command and its clauses.</li> <li>Working with Views, Sequence, Index and Synonyms.</li> </ul>	12
5	<ul style="list-style-type: none"> <li>Write the basic PL/SQL Programs.</li> <li>Write a program to implement cursors.</li> <li>Programs based on Exceptions handling.(Predefined and user-defined exceptions)</li> </ul>	12
6	<ul style="list-style-type: none"> <li>Write different Stored Procedures and Functions</li> <li>Write programs for creating Various Triggers.</li> <li>Working with Exporting and importing the file.</li> </ul>	12
<b>Total</b>		<b>32</b>

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**Instructional Strategy:**

Sr. No.	Topic	Instructional Strategy
1	Introduction to database concepts	Explanation of database concept
2	Relational Data Model	Explanation & implementation queries related to table
3	Interactive SQL	Explanation & implementation queries related to table
4	SQL Performance Tuning	Defining and using views. Implementation of View, Sequence, Index and Snapshot.
5	PL/SQL	Explanation & implementing PL/SQL block of code.
6	PL/SQL Database Objects and Oracle Utilities	Explanation & writing different procedures & functions and Triggers. Also Explanation of different utilities.

**Text Books**

Sr. No	Author	Title	Publication
1	Junnarkar, Adavi	Applied Mechanics	Charotar Publishers
2	Dadhe, Jamdar, Walawalkar	Applied Mechanics	Sarita Prakashan
3	Khurmi	Applied Mechanics	S. Chand

**Reference Books:**

Sr. No	Author	Title	Publication
1	Beer & Johnson	Vector Mechanics For Engineers (Statics & Dynamics)	Mc - Graw Hill Co., USA
2	McLean & Nelson ( Schaum's Series )	Engineering Mechanics	Mc - Graw Hill Co., USA
3	Timoshenko & Young	Engineering Mechanics	Mc - Graw Hill Co., USA

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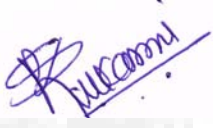
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**Learning Resources:** Books, Models

**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Introduction to Data base systems	04	04	02	10
2.	Relational Data Model	04	04	04	12
3.	Interactive SQL	05	04	06	15
4.	SQL Performance Tuning	04	04	05	13
5.	PL/SQL	04	02	04	10
6.	PL/SQL Database Objects and Oracle Utilities	08	04	08	20
Total		29	22	29	80

  
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**Programme** : Diploma in Computer Engineering  
**Programme Code** : 06  
**Name of Course** : Digital Techniques  
**Course Code** : CM466

**Teaching Scheme:**

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests, each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	25	--	25

**Course Rationale:**

This subject forms the foundation of digital electronics system. It is essential to know these fundamentals to understand the concept of microprocessor & its application.

**Course Objectives:**

After studying this course, the student will be able to

- Know the concept of Digital circuits.
- Understand the operations of fundamental digital circuits.
- Simplify logic circuit using Boolean algebra.
- Construct simple logic circuits, counters using IC's.
- Explain the function of various digital IC's.

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**Course Content:**

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1	Number System & Codes			
	1.1	Introduction	08	12
	1.2	Number Systems : Binary Number System, Signed Binary Numbers, Octal Number System, Hexadecimal Number System , Binary Arithmetic		
	1.3	One's Complement & Two's Complement arithmetic , 9's Complement & 10's complement Arithmetic		
	1.4	Codes: BCD, Gray codes, Excess 3 code, Error detecting & Correcting Codes		
2	Logic Gates and Boolean Algebra			
	2.1	Introduction	10	12
	2.2	Working principals and Truth of AND,OR,NOT, NOR, NAND, EX-OR, EX-NOR Gates		
	2.3	Characteristics of Digital IC's		
	2.4	Universal Gates		
	2.5	Boolean Algebra : Basic Boolean Operations , Basic Law's of Boolean Algebra , Duality Theorem, De-Morgan's Theorems		
3	Combinational logic design			
	3.1	Introduction	08	10
	3.2	Standard Representation For Logic Functions		
	3.3	Karnaugh Map Representation & Simplification of Logic Functions		
	3.4	Minimization of Logic Functions Specified in Minterms / Maxterms or Truth Table		
	3.5	Minimization of Logic Functions not Specified in Minterms / Maxterms		
	3.6	Don't care conditions		
	3.7	Design Examples : Arithmetic Circuits		
4	Combinational logic design using MSI circuit			
	4.1	Introduction	14	18
	4.2	Multiplexer and their use in combinational logic design		



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	4.3	De multiplexer / Decoders and their use in combinational logic design			
	4.4	Adders and their use as subtractors			
	4.5	BCD Arithmetic, Arithmetic Logic Unit(ALU)			
	4.6	Digital Comparators ,Parity Generator/Checkers			
	4.7	Code Converters: Priority encoders, Decimal to BCD Encoder ,BCD to Binary Encoder, Binary to BCD decoder , BCD to 7-segment decoder			
5	Flip Flops				
	5.1	Introduction, 1-Bit Memory Cell,	06	08	
	5.2	<ul style="list-style-type: none"><li>Clocked S-R Flip-Flop</li><li>J-K Flip-Flop</li></ul>			
	5.3	<ul style="list-style-type: none"><li>Race Around Condition</li><li>Master-Slave J-K Flip-Flop</li></ul>			
	5.4	<ul style="list-style-type: none"><li>D-Type Flip-Flop</li><li>T- Type Flip-Flop</li></ul> Applications of Flip-Flops			
6	Sequential Logic Design				
	6.1	<ul style="list-style-type: none"><li>Introduction</li><li>Registers,</li></ul>	12	14	
	6.2	<ul style="list-style-type: none"><li>Shift register :<ul style="list-style-type: none"><li>-Serial in- Serial Out (SISO)</li><li>-Serial in-Parallel Out (SIPO)</li><li>-Parallel in-Serial Out (PISO)</li><li>-Parallel in- Parallel Out (PIPO)</li></ul></li></ul> Applications of Shift Registers			
	6.3	<ul style="list-style-type: none"><li>Counters :<ul style="list-style-type: none"><li>-Ripple or Asynchronous counter</li><li>-Synchronous Counters</li><li>-Ring counter</li><li>-Asynchronous UP/DOWN Counters</li><li>-Modulus of the Counter</li></ul></li></ul>			

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<b>7</b>	<b>A to D &amp; D to A Converter</b>			
	7.1	Introduction Digital-to-Analog Converters -An Example of D/A Converter IC -Sample- and -Hold	<b>06</b>	<b>06</b>
	7.2	Analog-to-Digital Converters -An Example of A/D Converter IC. Introduction to PLA/PAL		
Total			<b>64</b>	<b>80</b>

**List of Practicals/Experiments/Assignments:**

<b>Sr. No.</b>	<b>Name of Experiment/Assignment</b>	<b>Hrs</b>
1.	To Simplify the arithmetic operations based on number system and codes	02
2.	To Study and verify the truth tables of basic logic gates To Derive OR, AND, NOT, EX-OR & EX-NOR gates using Universal gates	06
3.	To Minimize Logic Functions using K-Map To Maximize Logic Functions using K-Map	02
4.	To Study Multiplexer. To Study Demultiplexer. To Study Priority Encoder To Study BCD to 7-segment decoder.	08
5.	To Study S-R Flip-Flop. To Study J-K Flip-Flop. To Study D-Type & T-Type Flip-Flop.	08
6.	To Study Shift Register. To Design Asynchronous Up/Down counter using T-Type Flip-Flop. To Study BCD counter IC 7490.	04
7.	To Study Analog to Digital Converter. To Study R-2R Ladder type Digital to Analog converter	02
Total		<b>32</b>

**Instructional Strategy:**

Sr. No.	Topic	Instructional Strategy
1.	Number System & Codes	
2.	Logic Gates and Boolean Algebra	Explanation, Case study and Implementation
3.	Combinational logic design	
4.	Combinational logic design using MSI circuit	Explanation, Case study and Implementation
5.	Flip Flop	Explanation, Case study and Implementation
6.	Sequential Logic Design	Explanation, Case study and Implementation
7.	A to D & D to A Converter	Explanation and Case study

**Text Books:**

Sr. No	Author	Title	Publication
1.	R.P. JAIN	Modern Digital Electronics	McGraw-Hill
2.	R.P. JAIN	Principles Of Digital Techniques	McGraw-Hill

**Reference Books:**

Sr. No	Author	Title	Publication
1.	Albatr paul Malvind	Digital Principal & Application	TMH

**Learning Resources:** , LCD Projector, and Transferences, White board.

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**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1.	Number System & Codes	04	01	01	06
2.	Logic Gates and Boolean Algebra	05	02	03	10
3.	Combinational logic design	06	02	02	10
4.	Combinational logic design using MSI circuit	12	03	05	20
5.	Flip Flops	06	03	04	13
6.	Sequential Logic Design	06	02	03	11
7.	A to D & D to A Converter	06	02	02	10
Total		20	22	38	80

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**Programme** : Diploma in Computer Engineering  
**Programme Code** : 06  
**Name of Course** : Data Communication and Networking  
**Course Code** : CM467

**Teaching Scheme:**

	Hours /Week	Total Hours
Theory	04	64
Practical	02	32

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	3Hrs.	--	--	--
Marks	20	80	--	25	25

**Course Rationale:**

This course is aimed at providing the students with conceptual understanding of basics of communication systems.

**Course Objectives:**

After studying this course, the student will be able to

- Understand communication system.
- Understand the use of modulation as it applies to transmission.
- Understand the ISO/OSI model.
- Understand Multiplexing.
- Understand various communications link, topologies and recognize the advantages of one over other.

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**Course Content:**

Chapter No.	Name of Topic/Sub topic		Hrs	Weightage
1	Overview of Data Communications and Networking:			
	1.1	Data Communications: Components, Data Representations, data flow. Networks: Distributed Processing, Network Criteria, Physical Structures, Categories of Networks	08	10
	1.2	The Internet: A Brief History, The internet today, Protocols and Standards: Protocols, Standards and Organizations, Internet Standards, Network Models, Layered Tasks: Sender, Receiver and carrier, Hierarchy, Services.		
	1.3	The OSI Model: Layered Architecture, Peer-to-peer processes, Layers in the OSI model, Summary of Layers, TCP/IP protocol suite.		
	1.4	Addressing : Physical addresses, Logical addresses		
2	Physical Layer:			
	2.1	Signals :Analog and Digital Data, Analog and Digital Signals, Periodic and A periodic signals	12	14
	2.2	Analog Signals: Sine Wave, Phase, Time and Frequency domain, Composite Signals, Bandwidth.		
	2.3	Digital Signals: Bit Rate, Bit Length, Digital Signal as a composite analog signal, Transmission of Digital Signals: Baseband Transmission, Broadband Transmission.		
	2.4	Transmission Impairment: Attenuation, Distortion, Noise		
	2.5	Data Rate Limits: Noiseless channels: Nyquist Bit Rate, Noisy channel: Shannon capacity, Using both limits.		
	2.6	Performance: Bandwidth, Throughput, Latency, Bandwidth-Delay product		
	2.7	Transmission: Line Coding: Characteristics, Schemes.		
	2.8	Block coding: Some common block codes.		
	2.9	Analog-To-Digital Conversion : Pulse Code Modulation.		
	2.10	Transmission modes: Parallel transmission, Serial transmission.		

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	2.11	Analog Transmission : Digital-To-Analog Conversion : Aspects of Digital-to-Analog conversion, ASK, FSK, PSK, QAM		
	2.12	Analog-To-Analog Conversion: Amplitude modulation, Frequency modulation, Phase modulation		
3	Multiplexing and Spreading			
	3.1	Multiplexing: Frequency Division Multiplexing, Wavelength-Division Multiplexing, Synchronous Time-Division Multiplexing, Statistical Time-Division Multiplexing.	13	16
	3.2	Spread Spectrum : Frequency Hopping Spread Spectrum, Direct Sequence Spread Spectrum		
	3.3	Transmission media: Guided media: Twisted pair cable, Coaxial cable, Fiber Optic cable. Unguided media: Radio waves, Microwaves, Infrared Waves		
	3.4	Switching : Circuit Switched networks, Datagram Networks, Virtual-Circuit Networks, Structure of a Switch : structure of circuit switches, structure of Packet switches		
	3.5	Telephone Network: Major Components, LATAs, Signaling , Services provided by Telephone networks, Dial-up Modems : Modem Standards. Digital Subscriber Line ADSL, HDSL, SDSL, VDSL		
4	Data Link Layer			
	4.1	Error Detection and Correction Types of Errors: Single bit error, Burst Error. Redundancy, Detection Vs Correction, Forward error correction Vs Retransmission.	13	16
	4.2	Block coding: Error detection, Error correction, Hamming Distance, Linear Block Codes, Cyclic codes: Cyclic Redundancy Check, Polynomials, Advantages of cyclic codes, Checksum.		

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	4.3	Data link control: Framing, Flow and error control, Protocols, Noiseless Channels: Simplest protocol, Stop-and-Wait Protocol, Noisy Channels : Stop-and-Wait Automatic Repeat Request, Go-Back-N Automatic Repeat Request, Selective repeat Automatic Repeat Request, Piggybacking.		
	4.4	HDLC: Configuration and Transfer modes, Frame Format, Control Field, Examples Multiple Access		
5	Point-to-Point Protocol:			
	5.1	Framing, Transition Phases, Multiplexing, LCP, PAP, CHAP, NCP, IPCP, Other Protocols, Multilink PPP, An Example.	10	14
	5.2	Multiple Access Random Access: ALOHA, CSMA, CSMA/CD, CSMA/CA, CSMA/CA and Wireless Networks.		
	5.3	Wireless Networks: Controlled access: Reservation, Polling, Token passing. Channelization: FDMA, TDMA, CDMA.		
	5.4	Wired LANs: Ethernet IEEE Standards, Standard Ethernet: MAC Sub layer, Physical Layer, Changes in the Standard: Bridged Ethernet, Switched Ethernet, Full-Duplex Ethernet.		
	5.5	Fast Ethernet: MAC Sub layer, Physical Layer. Gigabit Ethernet: MAC Sub layer, Physical Layer. Ten-Gigabit Ethernet: MAC Sub layer, Physical Layer.		
6	Wireless LANs			
	6.1	IEEE 802.11: Architecture, MAC Sublayer, Addressing Mechanism, Physical layer. Blue tooth: Architecture, Bluetooth Layers Connecting LANs, Backbone Networks and Virtual LANs	08	10



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	6.2	Connecting devices: Repeaters, Hubs, Bridges, Two Layer Switches, Routers, three layer switches, Gateway		
	6.3	Backbone Networks: Bus backbone, Star backbone, Connecting Remote LANs.		
	6.4	Virtual LANs: Membership, Configuration, Communication between switches, IEEE standards, Advantages		
<b>Total</b>			<b>64</b>	<b>80</b>

**List of Experiments/Assignments:**

Sr. No.	Name of Experiment/Assignment	Hrs
1	Study of LAN topologies.	02
2	Designing layout of a Network for small organization 1. Deciding upon type of network 2. Floor designing/ building designing 3. Deciding upon number/ length of components	04
3	Study of Structured cabling issues and various components with their specifications involved in it – Connectors, Ports, Labels, Jackpanels, Racks etc.	04
4	Study of RJ-45 standards	02
5	Crimping for RJ-45 according to desired standards and formation of cross cable and direct cable.	06
6	Study of RS232 standard.	02
7	Write a program to implement CRC.	02
8	Write a program to implement checksum method.	02
9	Write a program to check and correct the error in the data at receiver end by implementing hamming code.	02
10	Write a Program for bit Stuffing and Byte stuffing.	02
11	Study MAC address and use of ipconfig config to display MAC address.	02
12	Study of specifications of layer2 switches, hubs , repeaters and listing their manufacturers.	02
<b>Total</b>		<b>32</b>

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**Instructional Strategy:**

Sr. No.	Topic	Instructional Strategy
1	Overview of Data Communications and Networking:	Introduction and Explanation, Slide Presentation for Data communication
2	Physical Layer:	Explanation, Slide Presentation and demonstration of actual cables and connectors.
3	Multiplexing and Spreading	Explanation, Slide Presentation for Multiplexing
4	Data Link Layer	Explanation, Slide Presentation, Simulation of Algorithms
5	Pont-to-Point Protocol	Explanation, Slide Presentation, Simulation of Algorithms
6	Wireless LANs	Explanation, Slide Presentation and demonstrating actual existing topology

**Text Books:**

Sr. No	Author	Title	Publication
1	Behrouz A. Forouzan	Data Communications and Networking	Tata McGraw Hill (Fourth Edition)

**Reference Books:**

Sr. No	Author	Title	Publication
1.	Andrew S. Tanenbaum	Computer Networks	PHI Publications.
2.	Behrouz A. Forouzan	Data Communications and Networking	Tata McGraw Hill (Second and Third Edition)
3.	Taub Schilling	Principles of Communication Systems	Tata McGraw Hill (Fourth Edition)
4.	D.C. Agarwal	Fiber Optic Communication	Wheeler Publishing (Second Edition)

**Learning Resources:** Books, Models

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**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Overview of Data Communications and Networking:	08	02	--	10
2	Physical Layer:	05	03	04	12
3	Multiplexing and Spreading	10	03	03	16
4	Data Link Layer	10	03	03	16
5	Pont-to-Point Protocol	10	03	03	16
6	Wireless LANs	08	02	--	10
Total		51	16	13	80



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**Programme** : Diploma in Computer Engineering  
**Programme Code** : 06  
**Name of Course** : Web Designing  
**Course Code** : CM468

**Teaching Scheme:**

	Hours /Week	Total Hours
Theory	02	32
Practical	04	64

**Evaluation Scheme:**

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests , each of 60 minutes	2Hrs.	--	--	--
Marks	10	40	50	--	25

**Course Rationale:**

In the Era of Web technology it is essential for every Diploma Engineering. To have knowledge of Web Designing. This course covers Web designing using HTML/DHTML.

**Course Objectives:**

After studying this course, the student will be able to

- Create HTML document and text editing
- Giving Links to text, inks to images.
- How to import images
- How to create tables, text alignments using Fonts
- Creation of Style sheets , HTML forms using various attributes.
- Creation of STATIC Website.

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- Adding various controls to web pages.

**Course Content:**

Chapter No.	Name of Topic/Sub topic		Hrs	Weigh tage
1	Introduction to Common HTML and Links and Addressing			
	1.1	Introduction to HTML	05	06
	1.2	Web Publishing		
	1.3	HTML Overview & Documents & Type		
	1.4	Linking Basics, What are URL’s, Linking in HTML, Anchor Attributes		
	1.5	Images and Anchors, Image Maps ,Semantic Linking with the <Link> Element.		
	1.6	Meta Information, Meta and the Name attribute , Linking Issues		
2	HTML Images And Layout: Text Alignment, Tables and Fonts			
	2.1	The Role of Images on the Web, Image preliminaries, Image Download issues.	05	05
	2.2	Obtaining Images, HTML Image Basics, Images as Buttons.		
	2.3	Image Maps, Full Syntax of Image ,Image and Color attributes for <BODY>		
	2.4	Design Requirements, HTML Approach to Web design, Alignment Choices		
	2.5	Text Alignment, Word Hinting, Alignment with Images, The <SPACER> element, The <MULTICOL> element.		
	2.6	Introduction to Tables, Simple Tables, ROWSPAN and COLSPAN, Tables for Layout, Tables in HTML 4.0 <TABLE> Syntax, Data binding, Fonts		
3	Advanced Layout: Frames and Layers			
	3.1	Overview of frames, Simple frame, Example, Frame targeting.	04	04
	3.2	Floating Frames, Using frames, Frame problems		
	3.3	Positioned Layers, In Flow Layers, Layers Syntax, Intersecting Layers		

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4	Style Sheets and HTML Forms			
	4.1	Style Sheets:-The Rise of Style, Style Sheet Basics, Style Sheet Example, Style Sheet properties.	04	05
	4.2	How are Forms Used? Forms Preliminaries, The <FORM> Element, ACTION Attribute, METHOD Attribute, Simple Form Syntax, Complete		
	4.3	Form Syntax, FORM controls, New and Emerging Form Elements,< BUTTON > element, Labels,<FIELDSET>,Form Accessibility Enhancement		
5	Introduction to Programmed Web Pages and Client side Scripting and HTML:			
	5.1	Overview of Client / Server	04	05
	5.2	Programming on the web, -Server side programming		
	5.3	Common gateway Interface, Active Server Pages.		
	5.4	Purpose of Scripting, Including scripts in a HTML Document.		
	5.5	Script Events and --HTML, Dynamic HTML and the Document		
	5.6	Object Model, HTML and Scripting Access		
6	Java Script And Client Side Programming & HTML			
	6.1	Embedding Java script in HTML Document	05	06
	6.2	Variables ,constants, Adding Comments		
	6.3	Operators: Assignment, arithmetic & comparison operators. control structure & looping .		
	6.4	Scripting, Programming and objects, Plug Ins <EMBED Syntax>, Java Applets		
	6.5	Active X Controls Adding controls to Web pages, <OBJECT> Syntax		
	6.6	Cross Platform Support with plug ins & ActiveX controls		

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7	XML : Beyond HTML			
	7.1	Relationship among HTML, SGML & XML	03	05
	7.2	Basic XML, Valid Documents, Ways to use XML, XML for data files, Embedding XML into.		
	7.3	HTML document, Converting XML to HTML for display ,Displaying XML documents by using CSS & XML, Reverting HTML as XML.		
8	Putting it All Together: Delivering the Websites			
	8.1	Publishing the site, Outsourcing web hosting, Virtual Hosting	02	04
	8.2	Running a local Web Server, How web servers work ,Maintaining a web Site		
Total			32	40

**List of Practicals / Experiments/Assignments:**

<b>Sr. No.</b>	<b>Name of Experiment/Assignment</b>	<b>Hrs</b>
1	Creation of HTML documents and text Editing using block level & text level elements, heading example	04
2	Giving Links to text, Creating and giving Links to List of items, link to one page to another, link within page, link to image.	04
3	Importing Images in HTML of various Formats, Creation of images as Buttons	06
4	Creation of Tables and text alignments using various Fonts. using multicol, spacer, row span, cols pan , different table layout, example of data binding & Fonts,	06
5	Creation of Frames, targeting Frames, floating Frames. Creation of Layers, inflow layer, intersecting layer	06
6	Creation of Style Sheets Using various attributes. Creation of HTML Forms Using various attributes	06
7	Creation of Active Server Pages.	06
8	Including Scripts in HTML Documents any five program	06

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9	Including java Scripts program in HTML Documents using loops 3 program	06
10	Adding Controls to Web. <ul style="list-style-type: none"><li>• Introduction to AJAX: Develop script using AJAX.</li><li>• Introduction to the concept of blogging.</li></ul>	04
11	Adding XML to webpage	06
12	Hosting the web Site. Create a project using Microsoft Expression/Front page	04
<b>Total</b>		<b>64</b>

**Instructional Strategy:**

<b>Sr. No.</b>	<b>Topic</b>	<b>Instructional Strategy</b>
1	Introduction to Common HTML and Links and Addressing:	Explanation practical execution
2	HTML Images And Layout: Text Alignment, Tables and Fonts	Explanation & practical execution
3	Advanced Layout: Frames and Layers	Explanation & practical execution
4	Style Sheets and HTML Forms	Explanation & practical execution
5	Introduction to Programmed Web Pages and Client side Scripting and HTML:	Explanation & practical execution
6	Java Script And Client Side Programming & HTML	Explanation & practical execution
7	XML : Beyond HTML	Explanation & practical execution
8	Putting it All Together: Delivering the Web Site	Explanation & practical execution

**Text Books:**

<b>Sr. No</b>	<b>Author</b>	<b>Title</b>	<b>Publication</b>
1	Thomas A.Powell	The Complete Reference: HTML	TMH



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**Reference Books:**


Sr. No	Author	Title	Publication
1.	Deborah S. Ray , Eric J. Ray	Mastering HTML 4.0	BPB

**Learning Resources:** OHP, LCD Projector and Transparency, Whiteboard.

**Specification Table:**

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Introduction to Common HTML and Links and Addressing:	02	02	02	06
2	HTML Images And Layout: Text Alignment, Tables and Fonts	01	03	01	05
3	Advanced Layout: Frames and Layers	01	01	02	04
4	Style Sheets and HTML Forms	02	02	01	05
5	Introduction to Programmed Web Pages and Client side Scripting and HTML:	01	02	02	05
6	Java Script And Client Side Programming & HTML	02	02	02	06
7	XML : Beyond HTML	01	02	02	05
8	Putting it All Together: Delivering the Web Site	01	01	02	04
<b>Total</b>		<b>11</b>	<b>15</b>	<b>14</b>	<b>40</b>

  
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