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Lesson Plan Version 10.0

Course: MCA-101 – Fundamentals of Information Technology		
MCA – 1 st Semester	No. of Theory Hours per Week: 04	No. of Practical Hours per Week: 2 (1 lab of 2 hrs.)

Course Outcome (CO):

COs for Theory (MCA-101):	
CO1	Explain the fundamentals of number system, logic circuits and microprocessor. (BTL2)
CO2	Understand basics of software, SDLC phases, translators, peripheral devices and graphic primitives. (BTL3)
CO3	Understand the basic functions of Operating Systems and DBMS. (BTL3)
CO4	Explore and demonstrate types of transmission media, communication protocols and Internetworking devices. (BTL2)

Recommended Books:

Books	S.No.	Details of the Books
Text Books	1.	Alex Leon and Mathews Leon, "Fundamentals of Information Technology", Leon Techworld, 2007. [AM]
	2.	P. K. Sinha and Priti Sinha, "Computer Fundamentals", BPB Publications, 2007. [PP]
	3.	Malvino and Leach, "Digital Principles and Application", TMH, 1999. [ML]
	4.	Ramesh S. Gaonkar, "Microprocessor Architecture Programming and Application with 8085", PHI, 2001. [RG]
Reference Books	1.	Mano M, "Computer System and Architecture", PHI. [MM]
	2.	Silberschatz & Galvin, "Operating System Concepts", Pearson. [SG]
	3.	Alex Leon and Mathews Leon, "Introduction to Computers", Vikas Publishing House, 2007. [LL]
	4.	Norton Peter, "Introduction to computers", TMH, 4th Ed., 2006. [NP]
	5.	Simon Haykins, "Communication System", John Wiley & Sons, 2006. [SY]
	6.	B. Basaraj, "Digital Fundamentals", Vikas Publications, 1999. [BB]
	7.	V. Rajaraman, "Introduction to Information Technology", PHI, 2006. [VR]
	8.	V. Rajaraman, "Fundamentals of Computers", PHI, 5 th Ed., 2006. [VM]
	9.	David Anfinson and Ken Quamme, "IT Essentials PC Hardware and Software Component on Guide", Pearson, 3 rd Ed., 2008. [DK]

Lesson Plan for Theory:

Lecture No.	Topics / Concepts to be Covered	Reference of the Book and its Chapter
UNIT I		
1	Introduction on Logic Gates and logic circuits	Chapter – 3 [PP]
2	NAND and NOR implementations	Chapter – 3 [PP]
3	Binary Arithmetic	Chapter – 2 [PP]
4	r's and (r-1)'s complements	Chapter – 3 [MM]
5	Number system	Chapter – 2 [VR] Chapter – 2 [MM]
6	Microprocessor concepts, Bus, Registers etc	Chapter – 4 [PP]
7	Types of Instructions – 1 byte, 2 byte and 3 byte	Chapter – 8 [MM]
8	Instruction set classification	Chapter – 8 [MM]
9	Arithmetic micro-operations	Chapter – 4 [MM]
10	Logical and shift micro-operations	Chapter – 4 [MM]
11	Branching Instructions and ALU design	Chapter – 4 [MM]
12	Buffer Reserved for Revision	
UNIT II		
13	Introduction to Hardware, Software and OS	Chapter – 7 [PP] Chapter – 10 [VR]
14	Introduction to SDLC and its various phases	Chapter – 7 [PP]
15	SDLC models – Waterfall and Iterative waterfall model	Chapter – 7 [PP]
16	Prototype model and Details of each phase	Chapter – 7 [PP]
17	Design phase with decision tables, decision trees, Flowcharts and algorithms	Chapter – 8 [PP]
18	Testing and implementation phase	Chapter – 7 [PP]
19	Various types of translators and languages	Chapter – 9 [PP] Chapter – 10 [VR]
20	Introduction to Input-output devices	Chapter – 2,9 [VR] Chapter – 6 [PP]

Lecture No.	Topics / Concepts to be Covered	Reference of the Book and its Chapter
21	Storage devices and Graphics primitives	Chapter – 5, 6 [PP] Chapter – 6 [VR]
22	Buffer Reserved for Revision	
UNIT III		
23	Introduction to basic functions of an OS	Chapter – 10 [PP] Chapter – 10 [VR]
24	Types of OS – batch, multiprogramming, multitasking, real time etc	Chapter – 10 [PP]
25	Introduction to Process management and Process Life cycle model	Chapter – 4 [SG]
26	Types of Schedulers and PCB	Chapter – 5 [SG]
27	Scheduling algorithms- FCFS and SJF	Chapter – 5 [SG]
28	Process communication and Multithreading concepts	Chapter – 5 [SG]
29	Process synchronization – basics and algorithms	Chapter – 6 [SG]
30	Semaphores	Chapter – 6 [SG]
31	Buffer Reserved for Revision	
32	Introduction to memory management and MMU	Chapter – 10 [PP]
33	Paging and page table	Chapter – 10 [PP]
34	Virtual memory and Demand Paging	Chapter – 10 [PP]
35	Page faults and Page Replacement Algorithms	Chapter – 9 [SG]
36	Introduction to File management	Chapter – 10 [PP]
37	File Allocation methods	Chapter – 10 [PP]
38	Introduction to DBMS, advantages and data models	Chapter – 11 [PP]
39	3-tier architecture	Chapter – 11 [PP]
40	Buffer Reserved for Revision	
UNIT IV		
41	Networking basic concepts	Chapter – 12 [PP] Chapter – 8 [VR]

Lecture No.	Topics / Concepts to be Covered	Reference of the Book and its Chapter
42	Types of communication media	Chapter – 12 [PP]
43	Multiplexing and Switching techniques	Chapter – 12 [PP]
44	Analog and digital transmission, modulation techniques	Chapter – 12 [PP]
45	Introduction to communication protocols	Chapter – 12 [PP]
46	OSI model –layers (Physical and Data Link layers)	Chapter – 12 [PP]
47	OSI model –layers (Network and Transport layers)	Chapter – 12 [PP]
48	OSI model –layers (Session, Presentation and Application layers)	Chapter – 12 [PP]
49	Internetworking devices and distributed computing	Chapter – 12 [PP]
50	Buffer Reserved for Revision	

Course Outcomes (COs):

Course: MCA-151 – Fundamentals of IT Lab	
MCA – 1 st Semester	No. of Practical Hours per Week: 2 (1 lab of 2 hrs.)

COs for Practical (MCA-151):	
CO1	Design logic circuits based on boolean expressions and basic micro-operations. (BTL6)
CO2	Develop effective communication, data analysis and interactive presentations using MS Office tools and problem solving using SSAD tools. (BTL6)
CO3	Use different Operating Systems (Windows and Linux) and databases through SQL commands. (BTL3)
CO4	Work with various types of transmission media and inter-networking devices with their functions. (BTL3)
CO5	Work in teams to assemble and troubleshoot PC. (BTL6)

Lesson Plan for Practical

Week No.	Lab No.	Topics / Concepts to be Covered	Reference of Lab Manual
1.	1.	Designing circuits using basic gates and universal gates (NAND / NOR) in Logisim	Assignment A (Problem AP1 to AP4)
2.	2.	Exploring features of MS Word	Assignment B (Problem BP1)
3.	3.	Exploring features of MS Powerpoint.	Assignment B (Problem BP3)

Week No.	Lab No.	Topics / Concepts to be Covered	Reference of Lab Manual
4.	4.	Exploring features of MS Excel and using built-in functions, ranges, charts, pivot table reports, goal seek etc.	Assignment B (Problem BP2)
5.	5.	Buffer Reserved for Revision	Assignment A – B
6.	6.	Designing solutions for computational problems using flowcharts and writing algorithms for the same.	Assignment C (Problem CP1 to CP6)
7.	7.	Designing Decision tables and Decision trees for given case studies.	Assignment D (Problem DP1 to DP5)
8.	8.	Various File and Directory management commands in Linux and exploring Linux file system	Assignment E (Problem EP1)
9.	9.	Buffer Reserved for Revision	Assignment C – E
10.	10.	File management commands on Windows Command Prompt	Assignment F (Problem FP1)
11.	11.	Writing SQL queries for retrieving desired records from tables and exploring the use of DDL and DML commands.	Assignment G (Problem GP1)
12.	12.	Understanding functionalities of basic internetworking devices and different hardware to assemble a computer system.	Assignment H (Problem HP1 to HP2)
13.	13.	Buffer Reserved for Revision	Assignment F – H

Testing Schedule:

Nature of Test	August	September	October	November
Surprise Test (ST)			ST in any of the Weeks	
Mid Term Test (MT)		MT in 2 nd / 3 rd Week		
Class Test (CT)	CT-1 in any of the Weeks			CT-2 in any of the Weeks
Supplementary Test (Sp.T)				Sp. T in 1 st week

Nature of Test	August	September	October	November
Assignment Submission Schedule	Assignment-1 is to be submitted One Week after completion of Unit-1 and Unit-2. Assignment-2 is to be submitted One Week after completion of Unit-3. Assignment-3 is to be submitted One Week after completion of Unit-4.			

Suggested Topics for Presentation:

S. No.	Suggested Topics for Presentation
1.	Virtual memory and Demand Paging
2.	Paging
3.	Segmentation
4.	Register set and instruction set
5.	ALU Design
6.	Decision Tables with case study
7.	Micro operations with examples
8.	Types of Operating Systems
9.	Database models
10.	Network Devices : Bridges, Routers, Hubs etc
11.	IP addresses and classes
12.	Comparison of SDLC models
13.	Input Devices and Output Devices
14.	Interprocess communication of processes
15.	OSI model

Suggested Topics for Group Discussion:

S. No.	Suggested Topics for Group Discussion:
1.	Various Memory Management schemes
2.	TCP/IP model vs. OSI model
3.	Types and configurations of Internetworking devices
4.	Latest I/O Devices and storage devices
5.	Applications of Multiplexers
6.	Process and its types