MDC- 112: FUNDAMENTALS OF COMPUTER SYSTEMS

(Contact Hours-45, Credits-3)

Course Objectives (COs):

To understand the fundamental organization of a digital computer. To understand data representation along with theoretical basic knowledge of operating systems.

Learning Outcomes (LOs):*Students will be able to u*nderstand the basic informationrelated tohardware and software.To gain basic knowledge of number system, Boolean logic along with types of operating system and network.

UNIT -I:Computer Fundamentals   15 Hours

Generations of Computer (I-V) , Block Diagram of a Computer Functions of the Different Units (Input unit, Output unit, CPU (ALU+CU)) , Input & Output Devices , Memories, Memory hierarchy, Registers and Types, Cache Memory , Primary Memory (Ram, How data is stored in a RAM) DRAM and SRAM, ROM ROM BIOS/ Firmware Types of ROM Secondary Memories , Solid State Drive , CD /DVD. Software, System Software and Application Software , Computer Languages: Machine language, Assembly language, High level language, Program Language Translators, Compiler, Assembler Interpreter.

UNIT -II: Number Systems and Boolean Algebra   15 Hours

Bit, Byte, Nibble, Word, Binary Number, Binary Arithmetic (Addition, Subtraction, Multiplication, Division), Hexadecimal number system, Octal number system, Conversion between number systems, Binary codes (BCD, ASCII, EBCDIC). Gates AND, OR, NOT, NAND, NOR, XOR and XNOR operations, Boolean variables, postulates and theorems of Boolean Algebra, Boolean functions, Simplification of Boolean expressions by algebraic method, Dual and Complement of a Boolean expression.

UNIT -III:Basics of Operating System & Network   15 Hours

Operating System: Overview, Evolution of Operating System, functions and importance of operating system, types of operating system (GUI and Non GUI), Open source and Non Open Operating System, their advantage and disadvantage , Batch Operating System , Real-Time , Operating System , Distributed Operating System ,Embedded Operating System , Network Operating System , Mobile Operating System. Basics of Networking , LAN ,MAN ,Wan , Arpanet.

Suggested Readings:
Text Books:

1. Rajaraman, Neeharika Adabala, Fundamentals of Computers 6th Edition , Prentice Hall India Learning Private Limited, 2014.
2. Morris. M. Mano, *Digital Logic and Computer design*, 3rd Edition, Prentice Hall India 2002.

Reference Books:
1. Malvino& Leach, Digital Computer and Applications, 4th Edition, Tata Mc-Graw Hill Company, 2015.
2. Reema Thareja, Fundamentals Of Computers 2nd Edition, Oxford University Press, 2026.