LOK JAGRUTI KENDRAUNIVERSITY

Syllabus for Two Years

School of Computer Applications, Master of Computer Applications (MCA)

Semester: I

Course Code	040110101			
Category	Supplementary Subject			
Course Title	Fundamentals of Computer (FOC)			
Scheme and Credits	Theory	Tutorial	Lab	Credits
	4	1	0	5
Pre-requisites (if any)	The course teaching language is English, so students have to have communication, reading and apprehension skills of English.			

1. Course Objectives:

1	To understand the basic terms and settings of computer
2	To understand the various number system and their applications
3	To design the logical circuit using gates as per the requirement
4	To understand working of different gates as it is required for further studies such as computer networks
5	To understand the working of the components of the computers like flip flops, adders, multiplexer
6	To understand various storage devices and buses used in the computer system
7	To understand the components of computer system
8	To understand the operating system concepts

2. Course Contents

Unit	Course Content	Weightage
Unit I	**Working with Computer System** What is computer (A), applications of computer(A), architecture of computer(C), basic components of computer with their usage(A), peripheral devices of computer with their usage(A), various types of data storage devices(A), booting steps of computer system(A), basic computer settings (like computer name, work group, IP, DNS, proxy server, password, users, etc.)(C&A), basic trouble shooting of the computer system(A), various slots of mother board(A), optimizing the computer performance(A), plug & play concepts(A), working with internet drive storage(A), number system(binary, decimal, hexadecimal, octal)(C), number system conversion from one base to other base(C), addition and subtraction of binary number system(C)	25%
Unit II	**CPU Architecture** Processor organization(C), register organization(C), instruction cycle(C) **Introduction to Buses (C & A)** Interfacing buses (circuit diagrams not necessary), concepts of address bus, data bus and control bus, bus width (circuit diagrams not necessary) **Input and Output** External devices(A), I/O modules(C), Why DMA?, DMA (C)	20%
Unit III	**Circuit Design with Logic Gates** What is gate?(C) types of gates (AND gate, OR gate, NOT gate, NAND gate, NOR gate and XOR gate)(C), Boolean algebra, basic laws of Boolean algebra(C), evaluation of logical expression with or without parenthesis(A), De-Morgan's theorems(C), simplification of expressions(A), K-MAP, rules of K-MAP, 2 variable K-MAP, 3- variable K-MAP, 4- variable K-MAP. don't care condition in K-MAP(A). **Combinational and Sequential Logic Circuit** What is adder?(C), working and construction of half adder (A &C) and full adder, construction of full adder from half adder(A), what is flip flop?(C), SR flip flop(C), multiplexer(C), encoder(A), decoder(A)	30%

Unit IV	**Introduction to Operating System (A)**	25%
	Operating system objectives and functions, types of operating system	
	Process Description and Control (C):	
	Process, process state, process description, process control and execution of the os.	
	Introduction to Scheduling (A)	
	Types of Scheduling (long term scheduling, medium-term scheduling, short-term scheduling, I/O scheduling), scheduling algorithms (FCFS scheduling, round robin scheduling, shortest job next scheduling).	

Desirable:
1) Installation of any one operating system
2) Report on JK flip flop, D flip flop, T flip flop, master slave flip flops (Each flip flop must be with truth table, circuit diagram, applications and limitations
3) Poster paper of generation of computer system
4) Overview of Special-purpose Operating System: Real Time Operating System (RTOS), Embedded Systems (Characteristics of Embedded Systems, TinyOS), Cloud Operating Systems, IoT Operating Systems

3. Text Books:
1) Digital Computer Fundamentals, Tata McGraw Hill, 6th Edition, Thomas C. Bartee
2) Computer System Architecture, PHI/Pearson Education, 3rd Edition, M. Morris Mano
3) Digital Logic and Computer Design, PHI Publication, 6th Edition, M. Morris Mano.
4) Introduction to Computers, Peter Nortion, 7th Edition, McGraw Hill.
5) How Computers Work, By Ron White, Nineth Edition, Pearson Education.
6) William Stallings, "Computer Organization and Architecture", 10th Edition, Pearson
7) StallingW, "OperatingSystems", 7th edition, PrenticeHallIndia.

4. Accomplishment of the student after completing the course : :
- Can identify different components of the computer and change setting
- Can understand how the data are stored and manipulated by the computers
- Can understand how binary data transfer from one location to other location
- Can design customized number system
- Can design the circuit as per the any given input and output combinations.
- Can design custom built various basic components of the computer system like: memory using flop flops, adder, multiplexer, etc.
- Can understand how the program written in any higher level language can be translated in lower level language
- Can understand when the system is started (booted), what happens.
- Can understand the working of operating systems