Course: BCA (GU-FYUGP)

Paper name: Computer Organization and Architecture

Theory credit: 4, Practical credit: 0

Course Instructor: Pinak Loshan Patowary

Assessment Method: Internal Exams, Assignment Marks & Attendance

Period: February – August 2024 – December2024

Total no of Classes required as per syllabus = 60 Hours (T- 60, P- 0)

Mode of Teaching: Class Room Teaching

Lecture no.	Topics covered	Mode of Teaching	Assessment Method
UNIT 1: Introduction (4 Lectures)			
1	Definitions of Computer Organization and Architecture, History of computer architecture,	Classroom Teaching + ICT Tools	Quiz, Class Test and Sessional Examination (Syllabus for Sessional Exam-1)
2	Basic functional blocks of a computer		
3	Input-output subsystems, Control unit,		
4	Types of register- general purpose registers, special purpose registers, index registers.		
UNIT 2: Data Representation (8 Lectures)			
5 , 6 and 7	Number system, Complements, Representation of signed numbers, Subtraction of unsigned numbers, Fixed-Point representation- Integer representation	Classroom Teaching + ICT Tools	Quiz, Class Test and Sessional Examination (Syllabus for Sessional Exam-1)
8, 9 and 10	Arithmetic addition, Arithmetic subtraction, Overflow, Decimal Fixed-Point representation, Floating-Point representation		
11 and 12	Other Binary Codes- Gray Code etc		
UNIT 3: Register Transfer and Micro-operation (8 Lectures)			
13 and 14	Introduction to Register Transfer Language, Register transfer	Classroom Teaching + ICT Tools	Quiz, Class Test and Sessional Examination (Syllabus for Sessional Exam-1)
15 an 16	Bus and Memory transfers, Arithmetic micro-operation- Binary adder, Binary adder-subtractor		
17	Binary incrementer		
18	Arithmetic circuit		
19 and 20	Logic micro-operation, Shift micro-operation, Arithmetic logic shift unit.		
UNIT4: Processing Unit (10 Lectures)			
21 and 22	Instruction codes, Computer registers, General register organization, Register stack, Memory stack		

23 and 24	Computer instructions, Data path in a CPU, Operations of a control unit, Hardwired control unit, Micro-programmed control unit		
25	Instruction cycle, Operands, Addressing modes, Instruction format	Classroom Teaching + ICT Tools	Quiz, Class Test and Sessional Examination (Syllabus for Sessional Exam-1)
26, 27 and 28	Three-address instructions, Two-address instructions, One-address instructions, Zero address instructions, Data transfer and manipulation- Data transfer instructions, Data manipulation instructions, Arithmetic instructions		
29 and 30	Logical and Bit manipulation instructions, Shift instructions,Program Control-Status bit conditions, Conditional branch instructions, Subroutine call and return, Instruction execution cycle, CISC and RISC architectures		
UNIT 5: Memory Organization (10 Lectures)			
31 and 32	Semiconductor memories, Memory cells	Classroom Teaching + ICT Tools	Quiz, Class Test and Sessional Examination (Syllabus for Sessional Exam-2)
33 and 34	SRAM and DRAM cells, Concept of hierarchical memory organization		
35, 36 and 37	Interleaved memories, Cache memory unit - Concept of cache memory, Mapping methods, Organization of a cache memory unit		
38, 39 and 40	Cache replacement policies, Write policy, Concept of virtual memory.		
UNIT 6: I/O Organization (10 Lectures)			
41 and 42	Access of I/O devices, I/O ports	Classroom Teaching + ICT Tools	Quiz, Class Test and Sessional Examination (Syllabus for Sessional Exam-2)
43 and 44	I/O control mechanisms - Program controlled I/O,		
45 and 46	Interrupt driven I/O, DMA controlled I/O,		
47 and 48	Interrupts: Types of interrupts		
49 and 50	Enabling and disabling interrupts, Handling interrupts.		
UNIT 7: Basics of Microprocessor and Assembly Language (10 Lectures)			
51 ,52 and 53	Basics of Microprocessor and Assembly Language Introduction to microprocessors, 8085 Microprocessor and its operation	Classroom Teaching + ICT Tools	Quiz, Class Test and Sessional Examination (Syllabus for Sessional Exam-2)
54	8085 instruction sets,		
55	Addressing modes in 8085,		
56	Classifications of instructions and addressing mode		
57	Assembly language programming basics		
58	Assembling,		
59	Executing and debugging the programs, Developing counters		
60	Time delay routines, Interfacing concepts		