

ST. ALOYSIUS COLLEGE (AUTONOMOUS), JABALPUR

Reaccredited 'A+ 'Grade by NAAC(CGPA:3.68/4.00)
College with Potential for Excellence by UGC
DST-FIST Supported & STAR College Scheme by DBT

Faculty of Science

Bachelor of Science (B.Sc.), I Semester
Subject: Computer Science
Paper-Elective
COMPUTER SYSTEM ARCHITECTURE

Course Outcomes

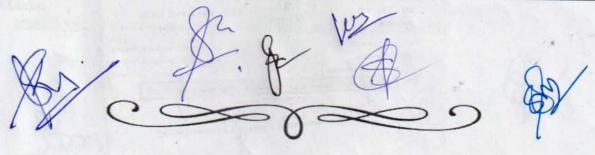
CO. No.	Course Outcomes	Cognitive
CO 1	Understand the basic structure, operation and characteristics of digital computer.	U, A
CO 2	Be able to design simple combinational digital circuits based on given parameters.	K
CO3	Understand the working of arithmetic & logic unit	11
CO 4	Know about hierarchical memory systems including cache memories and virtual memory.	U, An

Credit and Marking Scheme

	Credits	Marks		H
		Internal	External	Total Marks
Theory	3	40	60	100
Practical	1	40	60	100
Total	4	200		100

Evaluation Scheme

	Marks		
	Internal	External	
Theory	3 Internal Exams of 20 Marks (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)	
Practical	3 Internal Exams (During the Semester) (Best 2 will be taken)	1 External Exams (At the End of the Semester)	





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Subject: Computer Science

Paper: Elective, Computer System Architecture

Content of the Course

No. of Lectures (in hours per week): 2 Hrs. per week

Total No. of Lectures: 60 Hrs.

Maximum Marks: 60

Units	Estimate vina	No. of Lectures
Ι.,	Definition, Characteristics, Block Diagram of a Computer, Input devices - Output Devices Fundamentals of Digital Electronics: Number System-Binary, Decimal, Octal, Hexa-Decimal, Conversions, Binary Arithmetic-Addition, Subtraction, Multiplication, Division, Sign Magnitude, Complements-1's and 2's, Fixed-Point Representation, Floating-Point Representation.	10
П	Computer Memory, Volatile and Non-Volatile Memory, Primary: RAM, ROM, Secondary Memory: Magnetic Disk, Magnetic Tape, Optical Disk, Working of Magnetic Disk and Optical Disk, Introduction to system software: operating system and its functions, Types of operating system and its concepts.	10
Ш	Boolean Algebra, Reducing Boolean Expression, Logic Gates-AND, OR, NOT, Universal Gates-NAND, NOR, Analog and Digital Signals, Clock Waveform Timing, Map Simplification, K-Map-Two, Three and Four variables.	10
IV	Combinational Circuits- Adder, Sub-tractor, Multiplexer, De-multiplexer, Decoders, Encoders. Binary Codes – Gray Codes, ASCII, BCD code, EBCDIC, Error Detection Code and Correction Code, Hamming Code. Sequential Circuits - Flip-Flops, Registers, DMA, Flynn's classification, Multicore processors.	10

References

Text Books:

- · "Computer Fundamentals" by P.K.Sinha, Pearson
- "Computer system Architecture" by M. Morris Mano, Pearson

Reference Books:

- · "Computer system Architecture and Organization" by Patterson, McGraw Hill
- "Computer system Architecture & Organization" S.P.S. Saini, S. K. Katheria, Published by Katharia and Sons.

Web Links:

· https://www.javatpoint.com/computer-organization-and-architecture-tutorial



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List of Practical

(Digital Electronics)

- 1. To study basic gates (AND, OR, NOT) and verify their truth tables.
- 2. To study and verify NAND as a Universal gate using IC 7400.
- 3. To realize basic gate AND from Universal gate NAND.
- 4. To realize basic gate OR from Universal gate NAND.
- 5. To realize basic gate NOT from Universal gate NAND.
- 6. To study and verify NOR as a Universal gate
- 7. To realize basic gate AND from Universal gate NOR.
- 8. To realize basic gate OR from Universal gate NOR.
- 9. To realize basic gate NOT from Universal gate NOR.
- 10. Verification and Interpretation of truth table for XOR gate.
- 11. To study Half Adder using basic gates and verify its truth table.
- 12. To study Full Adder using basic gates and verify its truth table.
- 13. To design and construct RS flip Flop using gates and verify the truth table.
- 14. To design and construct JK Flip Flop using gates and verify the truth table.
- 15. To verify De-Morgan's First Law Theorem.
- 16. To verify De-Morgan's Second Law Theorem.

