

## COMPUTER FUNDAMENTALS AND DIGITAL DESIGN

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Upon successful completion of this course, students will be able to:

1. Recall and explain the different generations of computers, their functional units, basic I/O devices, storage devices, and bus structure.

- Knowledge: Identify the characteristics of different computer generations and functional units.

2. Apply the concept of data and information in basic problem-solving using flowchart and algorithm.

- Comprehension: Interpret data and information to create flowcharts and algorithms for problem-solving.

3. Classify different types of software and provide brief explanations for each type.

- Analysis: Compare and contrast various types of software to understand their functionalities.

4. Describe the advantages of networking and differentiate between LAN, MAN, and WAN. Understand the concepts of Intranet, Internet, servers, clients, ports, DNS, WWW, browsers, guided and unguided media, modem, email, voice and video conferencing.

- Evaluation: Evaluate the features of different types of networks and communication technologies for effective networking solutions.

5. Demonstrate proficiency in number systems and codes, including weighted and non-weighted codes, positional number systems, conversion between different number systems, and BCD.

- Application: Apply knowledge of number systems and codes to solve problems related to conversions and representations.

6. Perform binary arithmetic operations such as addition and subtraction.

- Application: Utilize binary arithmetic techniques to perform addition and subtraction operations.

7. Analyze logic gates (AND, OR, NOT, NAND, NOR, XOR), Boolean expressions, laws of Boolean algebra, simplification techniques, and design simple logic circuits.

- Analysis: Analyze and design logic circuits using Boolean algebra laws and simplification techniques.

8. Design and implement combinational circuits including adder/subtractor, comparator circuit, multiplexer, decoder, and encoder.

- Synthesis: Create combinational circuits using various components like adders, multiplexers, and decoders based on given requirements.

By the end of this course, students will have a solid understanding of computer fundamentals, digital design principles, and problem-solving techniques essential for a successful career in the field of computer science and technology.

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