CSH103 Digital Electronics and Applications	
Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	**Examination Scheme** Class Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: - Basic knowledge of Physics of 10+2 standard.

Course Objectives:

1. To describe various types of Number System, basic electronic components and hardware components of computer system.
2. To understand the concept of Boolean algebra, types of digital circuits, memories, addressing modes and I/O interface.
3. To solve problems related to number system conversions and calculation of binary codes.
4. To implement basic Boolean expressions using different Digital Electronic device.
5. To distinguish between types of digital circuit.
6. To design digital circuits for a particular functions using basic electronic components.

Detailed Syllabus

UNIT 1 **Introduction-** Digital versus Analog Signals, Electrical versus Electronics. **Number System and Codes -** Concept of number system bases – binary, octal, decimal and hexadecimal number systems and conversion between each, BCD, Excess-3, Gray Code, and Weighted Codes.
UNIT- II **Binary Arithmetic-** Binary Addition and Subtraction. Complements and Subtraction using complements, Multiplication. **Boolean Algebra-** Truth table, Boolean operators and precedence, Boolean laws, De-Morgan's Theorem, Principle of Duality, SOP and POS, Conversion from SOP to POS and vice versa, Canonical and standard forms. Reduction of expressions using Boolean laws and K-Map.
UNIT- III **Logic Gates-** Primary and Secondary Logic Gates, Designing of circuits using gates, Universal Gates, Implementation of circuits using NAND and NOR.
UNIT- IV **Combinational Circuits-** Half and Full Adder/Subtractor, Look-Ahead Carry Adder, Multiplexer, Demultiplexer, Encoder, Decoder and code-converter. Implementation using MUX and decoder.
UNIT- V **Sequential Circuits-** Latch, Flip-flop, Edge triggered flip-flop, RS flip-flop, J-K flip-flop D-type flip-flop, T flip-flop Excitation table and characteristic equation of flip-flops, Counters.

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UNIT- VI

Memory- General Memory Operation, ROM, RAM (Static and Dynamic), PROM, EPROM, EEPROM.

Text and Reference Books

1. Digital Logic & computer Design, M. Morris Mano, PHI, 2004.
2. Computer System Architecture, M. Morris Mano, PHI, 2004.
3. Computer Organization, Hamachar, Vranesic, McGrawHill, 5th Edition.
4. Computer Organization & Architecture, W. Stallings, PHI, 6th Edition.

Course Outcomes:

1. Differentiate between analog and digital circuits as well as electrical and electronics.
2. Perform number system conversion.
3. Find solution of binary arithmetic problem and understand Boolean algebra.
4. Implement any given Boolean expression using MUX, Decoder as well as Logic Gates.
5. Discrimination among various kind of memory devices with their need.