BCA 105: Digital Electronics and Computer Organization	
Teaching Scheme Lectures: 4 hrs/Week Tutorials: 2 hrs/Week Credits: 6	**Examination Scheme** Class Test -20 Marks Teachers Assessment - 10Marks Attendance – 20 Marks End Semester Exam – 100 marks

Prerequisite: - Basic knowledge of Computers Fundamentals and Physics of Intermediate 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 circuits, addressing modes, memories and I/O interface.
6. To design digital circuits for a particular functions using basic electronic concept.

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 conversions, BCD, Excess-3, Gray Code, and Weighted Codes.
Unit-2 **Binary Arithmetic- Arithmetic Operations on Binary numbers,** Subtraction. Complements and Subtraction using complements. **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-3 **Logic Gates-** Primary and Secondary Logic Gates, designing of circuits using gates, Universal Gates, Implementation of circuits using NAND and NOR.
Unit-4 **Combinational Circuits- Adders,** Subtractors, CLA, Multiplexer, De-multiplexer, Encoder and Decoder. Implementation using MUX and decoder. **Sequential Circuits-** Latch, Flip-flop, Introduction to RS flip-flop, J-K flip-flop D-type flip-flop, T flip- flop. Flip-flop Conversion
Unit-5 **Processor Organization- Introduction** and types of CPU Organization, Addressing modes, **I/O Organization -** Introduction to I/O organization, I/O interface and its need.

Head
Department of Computer Applications

Registrar

Dean Academics

Unit-6

Memory Organization- Memory Hierarchy, RAM and ROM chips, SRAM, DRAM, PROM, EEPROM, Introduction of Cache Memory and Virtual Memory.

Text and Reference Book

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

Course Outcomes:

After completing the course, students will be able to:

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. Understand the concept of internal CPU architecture and addressing modes.
6. Understand the concept of I/O interface.
7. Discrimination among various kind of memory devices with their need.