

**B.SC. PHYSICS**  
**SEMESTER - V**  
**SKILL BASED ELECTIVE COURSE - IV**  
**DIGITAL ELECTRONICS**

**UNIT I**

**Number system and codes**

Binary, Octal, Hexadecimal - inter conversion - Gray code - excess 3-code - ASCII code - basic gates - DeMorgan's theorem - universal gates.

**UNIT II**

**Boolean algebra**

Laws of Boolean algebra - solving Boolean expression - K-map - minterms - SOP - K-map simplification using minterm (2, 3 and 4 variables) - POS - K-map simplification using max terms (2, 3 and 4 variables) - incomplete specified functions.

**UNIT III**

**Arithmetic and logic circuits**

Half adder - Full adder - Half subtractor - Full subtractor - Decoder - BCD to seven segment decoder - Encoder - decimal to BCD encoder - multiplexer - applications - de-multiplexer.

**UNIT IV**

**Sequential circuits**

RS Flip flop using NOR and NAND gates - clocked RS flip flop - D flip flop - JK flip flop - Master Slave JK flip flop - Registers - Shift Registers (right to left and left to right) - applications.

**UNIT V**

**Counters and data converters**

Counters - modulus of a counter - asynchronous counter (4-bits) - synchronous counter (3-bits) - BCD counter - D/A conversion - R-2R binary ladder method - A/D conversion - successive approximation.

**BOOKS FOR STUDY**

1. Don Leach, Albert Malvino, Digital principles and applications, McGraw-Hill Inc., US (1994)
2. V. Vijayendran, Digital fundamentals. S. Viswanathan Printers and Publishers Pvt. Ltd., (2009)
3. Virendra Kumar, Digital electronics, New Age International Publishers (2007)
4. Avinashi Kapoor and L. K. Maheswari, Digital Electronics - Principles and Practice, Macmillan India Limited (2004)
5. D. A. Godse and A. P. Godse, Digital electronics, Technical Publisher, Pune (2008)
6. Morris Mano, Digital Logic and Computer Design, Pearson Education (2004)