DIGITAL LOGIC
BEG 171CO

Year: I   Semester: II

Teaching Schedule Hours/Works			Examination Scheme				
L	P	T	Final		Internal Assessment		Total
			Theory	Practical	Theory	Practical	
3	3	-	80	-	20	50	150

Objectives: To provide fundamental of digital electronics, digital computer design and application of digital devices.

1. **Binary Systems:**   (4 Hrs)
   1.1 Digital Systems
   1.2 Binary Numbers
   1.3 Number base Conversion
   1.4 Integrated Circuits

2. **Boolean Algebra and Logic gates:**   (5 Hrs)
   2.1 Basic Definition
   2.2 Boolean algebra and functions
   2.3 Logical Operator
   2.4 Digital Logic Gates
   2.5 IC Digital Logic families

3. **Combination Logic:**   (5 Hrs)
   3.1 Design procedure
   3.2 Adders
   3.3 Subtractors
   3.4 Code Conversion
   3.5 Analysis Procedure
   3.6 Multilevel NAND and NOR Circuits
   3.7 Exclusive – OR and Equivalence Function

4. **Combination Logic with MSI and LSI:**   (5 Hrs)
   4.1 Binary parallel adder
   4.2 Decimal Adder
   4.3 Magnitude Comparator
   4.4 Decoders
   4.5 Multiplexers
   4.6 Read Only Memory(ROM)
   4.7 Programmable Logic Array (PLA)

5. **Sequential Logic:**   (6 Hrs)
   5.1 Flip – Flops
   5.2 Triggering of Flip-Flops
   5.3 Analysis of Clocked Sequential Circuits
   5.4 Design with State Diagrams
   5.5 Design Procedure with Examples

30.

6. **Resisters, Counters and The Memory Unit:**   (6 Hrs)
   6.1 Registers
   6.2 Shift Registers
   6.3 Ripple Counters
   6.4 Synchronous Counters
   6.5 Design of Counter
   6.6 Timing Sequences
   6.7 The Memory Unit

7. **Processor Logic Design:**   (6 Hrs)
   7.1 Processor Organization
   7.2 Arithmetic Logic Unit
   7.3 Design of Arithmetic Circuit
   7.4 Design of Logic Circuit
   7.5 Design of Arithmetic Logic Unit
   7.6 Design of Shifter, Status Register

8. **Digital Integrated Circuits:**   (8 Hrs)
   8.1 Bipolar Transistor Characteristics
   8.2 RTL and DTL Circuits
   8.3 Integrated – Injection Logic (I^2L)
   8.4 Transistor – Transistor Logic (TTL)
   8.5 Emitter – Coupled Logic (ECL)
   8.6 Metal – Oxide Semiconductor (MOS)
   8.7 Complementary MOS (CMOS)

Laboratory:

There shall be at least 12 lab classes based on digital electronics:

Reference Books:

1. William I. Fletcher, "An Engineering Approach to Digital Design", Prentice Hall of India, New Delhi, 1990.
2. A. P. Malvino, Jerald A. Brown, "Digital Computer Electronics", 1995.
3. D. A. Hodges and H. G. Jackson, "Analysis and Design of Digital Integrated Circuits", McGraw – Hill, New York, 1983.
4. Mano, "Logic and Computer Design Fundamentals", Pearson Education.

31