DIGITAL INTEGRATED CIRCUITS
Code : EC 302(EI)
Credits : 4

Module I
Number systems and codes - Positional number system, Radix conversion, Different types of BCD, ASCII, EBCDIC, Gray.

Binary Arithmetic - R's and (R-1)'s complement representation, Subtraction using 1's and 2's complement representation, Concept of overflow, BCD addition.

Fundamental logic operators, Boolean Algebra. 2

Module II
Combinational Logic Design – Definition, Truth Table, SOP and POS realization from truth table

Logic minimization using K-map, Minterms and Maxterms, Minimization with don't care terms; Examples. Concept of combinational hazard

Quine-McClusky's tabular method of logic minimization

Examples of combinational logic design : Adder / Subtractor circuits; 2's complement ripple carry adder/subtractor circuit, Parity generator/checker circuit, Circuit for Binary to Gray and Gray to Binary conversion.
Encoder, Decoder, Demultiplexer and Multiplexer, Function realization using decoder and multiplexer.

Module III
Sequential machine design - Concept of Moore and Mealy machine, State transition diagram and State transition table
Various memory elements, latch and its use, Clocked flip-flops, SR, JK, D, T.
Timing constraints on edge triggered flip-flops

Conversion of one type of Flip-flop to another type, Design of sequence detector.
Asynchronous and synchronous counter design. Different types of registers. Sequence generator.

Module IV
Programmable Logic Devices – PROM, PLA, PAL, FPGA 4
Integrated Circuit Logic Families - TTL, PMOS, NMOS, CMOS