

1.	Title of the course	Digital Systems
2.	Course number	EE206L
3.	Structure of credits	3-1-0-4
4.	Offered to	UG
5.	New course/modification to	Modification To CS/EE2101/8
6.	To be offered by	Dept. of Computer Science and Engineering/Dept. of Electrical Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	Course Objective(s): To provide learning on the fundamentals of digital logic and to study the design principles of digital circuit and systems.	
10.	Course Content: Historical notes: Evolution of digital system design; Data representation and arithmetic: Number system, Operations, Codes, Binary logic operations, Boolean algebra, and Expression minimization/optimization; Combinational Logic Design: Realization of logic operation using gates, Analysis of fundamental properties of gates, Multiplexers, Demultiplexers, Encoders, Decoders, Ripple carry adder, Carry Look-ahead Adder, Subtractor, Multiplier, and Divider; Sequential Logic Design: Latches, Flip-flops, Clocking and timing analysis, Shift Registers, Universal Shift Register, Linear feedback shift register (LFSR), Synchronous and asynchronous counters, and Buffers/Queues, State machines (Mealy's, Morre's, and Algorithm state machine), State tables and State minimization; Advanced topics: Look-up table design, Programmable logic device (PLD), Field programmable gate array (FPGA), Read-only Memory, Content addressable memory, Random access memory.	
11.	Textbook(s): 1. Roth C H and Kinney L L, Fundamentals of Logic Design, Cengage Learning (2014). 2. Mano M M and Ciletti M D, <i>Digital Design: with Introduction to the Verilog HDL, VHDL, and SystemVerilog</i> , Pearson (2018).	
12.	Reference(s): 1. Brown S and Vranesic Z, <i>Fundamentals of Digital Logic with VHDL Design</i> , McGraw Hill (2009).	