BITE202L	Digital Logic and Microprocessors	L	T	P	C
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Pre-requisite	**NIL**	**Syllabus version**			
		1.0			

Course Objectives

1. To acquire the basic knowledge of digital logic components and circuits.
2. To prepare students to perform the design and analysis of digital electronic circuits.
3. To understand the architecture and the 8086 programming for the Intel microprocessors.

Course Outcomes

1. Understanding the structure of various number systems and Illustrate simplification of Boolean functions to achieve optimized design of digital logic circuits.
2. Demonstrate the design, and analysis of various combinational logic circuits and sequential logic circuits using flip flops and logic gates.
3. Deploy the sequential logic design techniques for developing various counters and Registers.
4. Demonstrate the knowledge of 8086 Microprocessor architecture to develop assembly language programs by applying various addressing modes, instructions sets, and assembler directives of the 8086 microprocessors.
5. Organize the working of different peripherals interfaced with 8086 Microprocessor.

Module:1	**Introduction to Digital Logic**	**6 hours**

Switching theory: Introduction to number systems, Logic gates: NAND, NOR gate as universal building blocks - Canonical Logic Forms, Simplification of two, three, four, and five -variable Boolean equations using the Karnaugh maps.

Module:2	**Combinational Logic Circuits**	**8 hours**

Design and analysis of combinational logic circuits: Standard logic (MSI) vs. programmable logic (PLD). Half adder, Full adder, Half subtractor, Full subtractor - 4-bit parallel adder-subtractor, Look ahead Carry generator and Magnitude Comparator, Decoders: 2X4, 3X8, 4X16, Decimal to BCD encoder, Multiplexers: 4-to-1, 8-to-1, 16-to-1, De-multiplexers, Binary Codes, converters and applications.

Module:3	**Sequential Logic Circuits: Design and Analysis**	**6 hours**

Latches to Flip flops: SR, JK, D and T, clock and triggering. Obtaining characteristic and excitation tables and flip flop conversions, Master-Slave flip flops. Design and analysis of sequential logic circuits and practice problems.

Module:4	**Sequential Logic Circuits: Registers and Counters**	**7 hours**

Design of counters: Asynchronous (Ripple) Counters- Up and Down Counters, counters with MOD number < 2^n Cascading Counters. Synchronous (Parallel) counters, Decade counter – Registers: registers with parallel load, Shift registers (SISO, SIPO, PISO, PIPO) – Ring, Johnson counter.

Module:5	**Microprocessor Architecture 8086**	**6 hours**

Programmer's Model, Block diagram, Pin diagram - CPU architecture – Flags, Segmentation- Minimum mode maximum mode operations.

Module:6	**Programming model of 8086**	**6 hours**

Programming model of 8086, Addressing modes, Instruction set, Assembler directives and Assembly language Programming of 8086. Practice programs.

Module:7	**Peripheral Chips**	**4 hours**

Block diagram – pin diagram, 8255 (PPI), 8254 (Timer), 8257 (DMA), 8259 (PIC), 8251 (USART)

Module:8	**Contemporary Issues**	**2 hours**

	Total Lecture hours:	**45 hours**
Text Book(s)		
1.	M. Morris Mano, Digital Logic and Computer Design, 4th edition, Pearson Education, 2015.	
2.	K Kant, Microprocessors and Microcontrollers: Architecture, Programming and System Design 8085, 8086, 8051, 8096, PHI, 2013.	
Reference Books		
1.	D .P. Kothari and J. S. Dhillon, 'Digital circuits and Design', Pearson Education, 2016.	
2.	Abhishek Yadav, Microprocessor 8085, 8086, Laxmi Publisher 2015.	
3.	Yu Cheng Liu, Glenn A. Gibson, Microcomputer Systems: The 8086/8088 Fami, PearsonIN Pub, 2015.	
4.	Digital Electronics by Dr. k Kaushik, Dhanpat Rai Publication, August 2015.	
Mode of Evaluation: CAT, Written assignment, Quiz, FAT		
Recommended by Board of Studies	15-11-2021	
Approved by Academic Council	No. 64	Date 16-12-2021