L	T	P	C
4	1	0	5

PH-9203   Digital Electronics

Course Outcomes:

After successful completion of the course, the students should be able to

CO1: understand the basic knowledge about components of digital electronics.

CO2: apply Boolean algebra and basic theorems to digital circuits.

CO3: use properly the various digital components in digital circuit diagrams.

CO4: explain the overall function of digital circuit.

CO5: design the microprocessor based programs for basic mathematical operations.

CO/PO Mapping

S-strong, M-medium and W-weak indicate the strength of correlation

COs	Programme outcomes (POs)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	W	W	W	W	W	M	M	S	S	S	S
CO2	S	S	S	M	S	W	M	W	M	W		W
CO3	S	M	M	W	W	S	S	S	S	M	S	S
CO4	S	S	W		M	M	M	M	M	S	W	W
CO5	M	W	S	W	S	M	S			W	M	M

L	T	P	C
4	1	0	5

PH-9203   **Digital Electronics**

UNIT-I

Number system and Gates: Decimal, binary, hexadecimal, octal and their inter-conversion, 1's and 2's representation, signed and unsigned numbers; binary addition, subtraction, multiplication; alphanumeric, BCD, gray codes and inter-conversion from binary to gray and gray to binary; Logic gates: AND, OR, NOT, NOR, NAND, XOR, XNOR and their truth tables; Development of Boolean Algebra, Boolean Algebra and logic gates, Laws of Boolean algebra. Demorgan's theorems, principle of duality, SOP, POS, min and max terms; Karnaugh Maps (upto four variables), Don't care conditions. **15Hrs**

Digital Circuits: Combinational Logic Circuits, logic levels, half and full adder, half and full subtractor, Decoders, Encoders, Multiplexers, De-multiplexers, Parity generators and checkers. One and two-bit magnitude comparators, Digital to Analog Conversion: Weight resistor, R-2R ladder, switched current and capacitor source types; Analog to Digital Conversion: counter, successive approximation, tracking, flash types. **15Hrs**

UNIT-II

Data Storage Circuits: Sequential circuits, FF and latches, triggering and operating characteristics of FF, SR, D, T and JK FF, race around condition and MS FF; inter-conversions of FF's, applications of FF, Shift registers: PIPO, PISO, SISO, SIPO, bidirectional, universal and applications of shift registers; Counters: ripple, asynchronous -two bit, mod-6, mod-10, T FF; Synchronous -three bit JK FF, three bit up/down, mod-6, 10 up/down T FF, mod-6 JK FF, ring counter, Johnson counter, Basics of semiconductor memories, RAM, ROM, the flash memory, magnetic and optical storage, Memory hierarchy, cloud storage. **20Hrs**

Microprocessors: Introduction, ideal microprocessor, the data bus, the address bus and the control bus, basic architecture of INTEL 8085 Microprocessor (block diagram approach), Assembly language, Machine language, Programming of 8085 Microprocessor, Instructions for basic mathematical operations: Addition, Subtraction, Multiplication and Division. **10Hrs**

Total: 60Hrs

BOOKS:
1. Integrated Electronics-Millman and Halkias-Tata Mc Graw Hill, 1983.
2. Solid Principles and Applications - Malvino & Leach-Tata Mc Graw Hill, 1991.
3. Pulse, Digital and Switching Waveforms – Millman and Taub-New York Mc Graw Hill, 1965.
4. Physics of Semiconductor Devices - S M Sze-John Wiley & Sons, 1969.
5. Linear Integrated Circuits – D Roy Choudhary
6. Digital Computer Electronics- A.P. Malvino-Tata Mc Graw Hill, 1986

c/BOS

7/7/2021

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