

Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
ESC-301	Digital Electronics	ESC	3	3	0	0	50	100	150

Course Outcomes

At the end of the course the student will be able to	
CO1	Understand and examine various number systems to be used in digital design.
CO2	Minimize the expressions using Karnaugh map method and implement them using Logic Gates.
CO3	Design and analyze various combinational and sequential circuits.
CO4	Understand and analyze various analog and digital converters.
CO5	Formulate problems and simplify with state minimizing techniques.

Detailed Syllabus**Section-A**

Unit 1: Data and number systems: Binary, Octal and Hexadecimal representation and their conversions; BCD, ASCII, EBCDIC, Gray codes, Excess-3 and their conversions; Signed and unsigned binary number representation with 1's and 2's complement methods, Binary arithmetic, overview of boolean algebra, simplification of logic variable using K-map method, Quine McCluskey method.

(12 Hrs)

Unit 2: Combinational circuits: Encoder, Decoder, Comparator, Binary Adder-Subtractor, Parallel Adder, Multiplexer, De-Multiplexer, Code converters and Parity Generator and checker, Memory Systems: RAM, ROM, EPROM, EEROM, Design of combinational circuits-using ROM, Programming logic devices and gate arrays (PLAs and PLDs).

(12 Hrs)

Unit 3: Sequential Circuits: Basic memory elements, S-R, J-K (master-slave), D and T Flip-Flops, their conversions with excitation table. Various types of Registers, Synchronous and Asynchronous Counters and their design. State Machine Design, State machine as a sequential controller, Moore and Mealy state machines.

(12 Hrs)**Section-B**

Unit 4: Analog and Digital Converters: Different types of A/D (flash, successive approximation, delta encoded) and D/A (R-2R Ladder and binary weighted) conversion techniques.

(6 Hrs)

Unit 5: Logic families: TTL, ECL, MOS and CMOS, their operation and specifications.

(4 Hrs)**Text Books**

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Modern Digital Electronics	R. P. Jain	McGraw-Hill	4th (2010)
2	Fundamentals of Digital Circuits	Anand Kumar	PHI	4th (2016)
3	Digital Electronics	A. K. Maini	Wiley India	1st (2007)
4	Digital Electronics	Kharate	Oxford	1st (2012)

Reference Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Digital Design	M. Morris Mano and Michael D Ciletti	Pearson	5th (2012)
2	Computer System Architecture	M. M. Mano	Pearson	3rd (2012)