

Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech I Sem.			
Course Code	FUNDAMENTALS OF DIGITAL ELECTRONICS CSE				
Teaching	Total contact hours-48	L	T	P	C
Prerequisite(s): Number systems		3	0	0	3

Course Objective(s):

- Understand the concepts of Binary system and conversions.
- Be familiar with the concepts of logical functions using Boolean algebra
- Learn various combinational circuits.
- Understand the functionality of flip flops and design of sequential circuits.

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: Understand various number systems, conversions, range and error detecting and Correcting codes and their significance.

CO-2: Evaluate the minimization of logic gates using Boolean algebraic principles.

CO-3: Evaluate the minimization of Boolean algebra using K-maps.

CO-4: Design various simple and complex combinational circuits with real time applications.

CO-5: Analyze the basic principles behind Flip flops and the design of sequential circuits with real time applications.

UNIT-1

Number Systems: Binary, Octal, Hex Decimal, and Conversions, Range; Binary additions and subtractions (using 1's and 2's complement), concept of overflow; representations of negative numbers using 1's and 2's complement and range; BCD numbers: Representation of 8421, 2421, Ex-3, Gray and self-complementary codes; additions and subtractions on 8421 codes; Error detecting codes: even, odd parity.

UNIT-2

Logic Gates and Boolean Algebra: Boolean Algebra and Digital Logic GATES, Basic Boolean Laws and properties; Boolean functions; canonical and standard forms (SOP, POS); Error correcting codes: hamming codes, block parity codes.

UNIT-3

Combinational Logic Circuits: Definition of combinational circuits, design procedure for half, full, decimal (8421), Gate minimization using three and four variable K-Map's with and without don't cares.

UNIT-4

Adders and Subtractors; Combinational Circuit Design for BCD code converters; Encoders, Decoders, Multiplexers, D-Multiplexers.

UNIT-5

Sequential Logic Circuits: Classification of Sequential circuits, latches, Flip Flops with truth tables and excitation tables, Registers and Different types of registers-shift register, bi-directional shift register.

Text Books

1. “Digital Design” – Third Edition, M. Morris Mano, Pearson Education/PHI.
2. “Digital Logic and Computer Organization”, V Rajaraman, T. Radhakrishnan, PHI, 2009.

Reference Books

1. “Switching and Finite Automata Theory”, 3/e, Kohavi, Jha, Cambridge.
2. Digital Logic Design, Leach, Malvino, Saha, TMH
3. Modern Digital Electronics, R.P. Jain, TMH

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-