C.U.SHAH UNIVERSITY – Wadhwan City

FACULTY OF: -Technology and Engineering (Diploma Engineering)
DEPARTMENT OF: -Electrical Engineering
SEMESTER: - IV   **CODE**: -2TE04DEI1
NAME – Digital Electronic and Digital Instruments (DEI)

Teaching & Evaluation Scheme:-

Subject Code	Subject Name	Teaching Scheme (Hours)				Credits	Evalution Scheme							Total Marks
							Theory				Practical (Marks)			
							Sessional Exam		University Exam		Internal		University	
		Th	Tu	Pr	Total		Marks	Hours	Marks	Hours	Pr	TW	Pr	
2TE04DEI1	Digital Electronic and Digital Instruments (DEI)	4	0	2	6	5	30	1.5	70	3	30	20	-----	150

Objectives:-

- To developed the basic knowledge of principles & concept of digital electronics.
- Solve number system problems using number system conversions.
- Understanding of working principle, construction & application of digital circuits & Digital Instruments

Prerequisites: - Basic Knowledge of Mathematics & Electronic concepts.

Course Outlines:-

Sr. No.	Course Contents	No Of Hours
1	**Number System:-** The Decimal Number System, The Binary Number System, Binary To Decimal Conversion, Decimal to Binary Conversion, Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division, The Octal Number System, Octal to Binary Conversion, Binary to Octal Conversion, Octal to Decimal Conversion, Decimal to Octal Conversion, The Hexadecimal Number System, Hexadecimal Counting Sequence, Binary to Hexadecimal Conversion, Hexadecimal to Binary Conversion, Hexadecimal to Decimal Conversion, Decimal to Hexadecimal Conversion, Octal to Hexadecimal Conversion, Hexadecimal to Octal Conversion.	10
2	**Logic Gates:-** Introduction, The AND Gate, The OR Gate, The NOT Gate, The NAND Gate , The NOR Gate, The Exclusive-OR Gate, The Exclusive-NOR Gate, NAND & NOR as Universal Gate, Inhibit Circuits.	8
3	**Boolean Algebra:-** Introduction, Logic Operations, Axioms & Laws Of Boolean Algebra, Complementation Laws, AND Laws, OR Laws, Commutative Laws, Associative Laws, Distributive Laws, de morgan's Laws, Complementation Laws, Double Negation Laws, Identity Laws, Null Laws, Absorption Laws, Consensus Theorem, Transposition Theorem, De Morgan Theorem, Duality, Duals, Reducing Boolean Expressions, Boolean Expressions And Logic Diagrams, Converting AND/OR/Invert Logic To NAND/NOR Logic,	**9**

	Determination of Output From The Diagram. **Karnaugh Map,** Introduction, Expansion of a Boolean Expression to SOP Form, Expansion of Boolean Expression to POS Form, Two Variable K-Map, Three Variable K-Map, Four Variable K-Map	
4	**Combinational Circuit:-** The Half Adder, The Full Adder, The Half Subtractor, The Full Subtractor, Parallel Binary Adders, BCD to Seven Segment Decoders, Digital to Analog Conversion, Analog to Digital Conversion.	8
5	**Flip-Flops, Counters & Registers:-** Flip-Flop Circuits R-S, T, D, J-K and Master Slave J-K, Shift Register, Asynchronous and Synchronous Counter Using 7493 and 7490, Up-Down Counter, Encoder and Decoder, Semiconductor Memory ROM, PROM, E-PROM.	12
6	**Digital Instruments & Display Devices:-** Comparison of Digital Instrument with Analog Instrument, Basic Building Blocks of Digital Instruments, Digital Volt-Meter-Ramp Type, Staircase Type, Digital Frequency Meter, Digital Multi Meter, Digital Watt Meter, Digital Energy Meter.	7

List of Experiments:-
- Testing of combinational logic gates and preparing truth table.
- Verify NAND and NOR gate as Universal gates.
- Perform Half adder and full adder circuit.
- Perform Half substraction and full substraction.
- Perform Clipping and clamping circuits.
- Verify the Demorgen's Theorem.
- Building and testing R-S and D flip-flops.
- Building and testing J-K master and slave flip-flops.
- To study about 4 bit binary asynchronous counter.
- To study 4 bit Up/Down counter.
- Study of decoder and encoder circuit truth table.
- To study about BCD to seven segment display.
- To study about A/D conversion.
- To study about D/A conversion.
- Study of seven segment LED display.
- Study of seven segment LCD display.

Learning Outcomes:-

- Application & importance of digital electronics.
- Definition & identification of various parts of microprocessor.
- Knowledge of digital circuits.
- Knowledge of combinational circuit & display devices.

Books Recommended:-
- Digital Principles and Applications **A. P. Malvino ,**TMH Pub.
- Pulse digital and switching wave forms **Millman & Taub** ,MH Pub.
- Principles of Digital Electronics **Malvino & Leach** TMH Pub.
- Fundamental of Digital Circuits **A.Anand Kumar** PHI Pub.