DIGITAL ELECTRONICS
B.E. SEM-IV SUBJECT CODE: EE-405

Course Objective:

The educational objectives of this course are
- To present a problem oriented introductory knowledge of Digital circuits and its applications.
- To focus on the study of electronic circuits.

Teaching / Examination Scheme

SUBJECT		Teaching Scheme				Total Credit	Evaluation Scheme					Total
		L	T	P	Total		THEORY		IE	CIA	PR. / VIVO	Marks
CODE	NAME	Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
EE-405	Digital Electronics	3	0	0	3	3	3	70	30	20	00	120

Detailed Syllabus
1. Number system and codes:Binary, octal, hexadecimal and decimal Number systems and their inter conversion, BCD numbers (8421-2421), gray code, excess–3 code, cyclic code, code conversion, ASCII, EBCDIC codes. Binary addition and subtraction, signed and unsigned binary numbers, 1's and 2's complement representation.

2. Boolean Algebra: Basic logic circuits: Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR and their truth tables,), Universal Gates, Laws of Boolean algebra, De-Morgan's theorem, Min term, Max term, POS, SOP, KMap, Simplification by boolean theorems, don't care condition

3. Logic Families: Introduction to digital logic family such as RTL, DTL, TTL, ECL, CMOS, IIR, HTL etc., theircomparative study, Basic circuit, performance characteristics, Wired logic, open collector output etc

4. Combinational Logic: The Half adder, the full adder, subtractor circuit. Multiplxer de-multiplexer, decorder, BCD to seven segment Decorder,encoders.

5. Flip flop and Timing circuit : set-reset laches, D-flipflop, R-S flip-flop, J-K Flip-flop, Master slave Flip flop, edge triggered flip-flop, T flip-flop.

6. Registers & Counters: Synchronous/Asynchronous counter operation,Up/down synchronous counter, application of counter, Serial in/Serial out shift register, Serial in/Serial out shift register, Serial in/parallel out shift register, parallel in/ parallel out shift register, parallel in/Serial out shift register, Bi-directional register.

Kadi Sarva Vishvavidyalaya, Gandhinagar
Bachelor of Engineering (Electrical Engineering Syllabus)

Lesson Planning

SR No.	No. of Hours	% Weightage in Exam	Topic
1	05		Number system and codes:Binary, octal, hexadecimal and decimal Number systems and their inter conversion, BCD numbers (8421-2421).
2	05	15	gray code, excess–3 code, cyclic code, code conversion, ASCII, EBCDIC codes. Binary addition and subtraction, signed and unsigned binary numbers, 1's and 2's complement representation.
3	10	20	Boolean Algebra: Basic logic circuits: Logic gates (AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR and their truth tables,), Universal Gates, Laws of Boolean algebra, De-Morgan's theorem, Min term, Max term, POS, SOP, KMap, Simplification by boolean theorems, don't care condition
4	10	15	Logic Families: Introduction to digital logic family such as RTL, DTL, TTL, ECL, CMOS, IIR, HTL etc., theircomparative study, Basic circuit, performance characteristics, Wired logic, open collector output etc
5	05	10	Combinational Logic: The Half adder, the full adder, subtractor circuit. Multiplxer de-multiplexer, decorder, BCD to seven segment Decorder,encoders.
6	05	10	Flip flop and Timing circuit : set-reset laches, D-flipflop, R-S flip-flop, J-K Flip-flop, Master slave Flip flop, edge triggered flip-flop, T flip-flop.
7	05	30	Registers & Counters: Synchronous/Asynchronous counter operation,Up/down synchronous counter, application of counter, Serial in/Serial out shift register.
			Serial in/Serial out shift register, Serial in/parallel out shift register, parallel in/ parallel out shift register, parallel in/Serial out shift register, Bi-directional register
TOTAL	45	100	

Instructional Method & Pedagogy

- At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
- Lecture may be conducted with the aid of multi-media projector, black board, OHP etc.
- Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.

- Two internal exams may be conducted and average of the same may be converted to equivalent of 15 marks as a part of internal theory evaluation.
- Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry a weight age of five marks in the overall internal evaluation.
- Surprise tests/Quizzes/Seminar /Tutorial may be conducted and having share of five marks in the overall internal evaluation.

Students Learning Outcomes

On successful completion of the course

- The student can acquire the basic knowledge of measurement principles and their application in electrical engineering.
- The students will be able to effectively employ electrical and electronics instruments for measurements of various electrical quantities.

Recommended Study Materials

Text &Reference Books:

1. Digital Fundamentals by Morris and Mano, PHI Publication
2. Fundamental of digital circuits by A.ANANDKUMAR,PHI Publication
3. Digital Fundamaentals by FLOYD & JAIN, Pearsons Pub
4. Fundamentals of Logic Design by Charles H. Roth Thomson