

COURSE INFORMATION

Course Code: EC(EE)-302

Course Name: DIGITAL ELECTRONICS CIRCUITS

Contacts: 3

PREREQUISITES

To understand this course, the student must have idea of:

- Basic concepts of number system.
- Basic knowledge of feedback system.
- Basic knowledge of electronic circuits.
- Concepts of circuit theory.

SYLLABI

Refer to University website

BEYOND SYLLABI COVERAGE

EC(EE)-302. I **Design** different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.

EC(EE)-302. II **Analyze** different types of digital electronic circuit using various mapping and logical tools.

Lecture Plan:

Cl. No.	Date	Topics	Remarks
1&2		Concept of digital data, Binary representation of integers, Octal and Hexadecimal representation and their conversion.	
3& 4		BCD, ASCII, EBDIC, Gray codes and their conversion, Signed binary numbers representation with 1's and 2's complement methods, Binary arithmetic: addition, subtraction, multiplication. Sign-Magnitude Binary representation.	
5		Boolean algebra: Various logic gates and their truth tables and circuits (NOT, AND, OR, XOR, NOR and NAND). universality of NOR and NAND gates.	

6		Normal forms, minterms, maxterms. Minimization of logic expressions by algebraic method, Representation in SOP and POS forms,	
7&8		Minimization of logic expressions by algebraic method, K-map method and Don't care conditions.	
9&10		Application and circuits of 1-bit half adder and full adder	
11&12		Application and circuits of 1-bit half subtractor circuit and full subtractor circuit.	
13		Application and circuits of Encoder.	
14		Application and circuits of Decoder.	
15		Application and circuits of Comparator.	
16		Application and circuits of Multiplexer.	
17		Application and circuits of De-Multiplexer	
18		Application and circuits of parity Generator	
19		Design the circuit of different Code converters.	
20&21		GATE numericals solved	
22		Sequential circuits: Clocks and timing circuits: Waveform, Schmitt trigger, monostable multi-vibrator. Basic memory elements, Flip Flops.	
23- 26		Clocked Flip Flops: R-S, J-K and T. D-latch and D-flipflop.master slave J-K F/F.	
27		Constructing other F/F's by JK, T and D.	
28&29		various types of Registers and Shift registers, parallel load and serial load.	
30&31		Ripple Counters & their design	
32-34		Synchronous counters & their design. Irregular counter, State table & State transition diagram, Sequential circuit design methodology	
35		Principal of Ring Counters, Johnson counter.	
36&37		GATE numericals solved	

38&39		Memory systems: RAM, ROM, EPROM, EEROM	
40		Design of combinational and sequential circuits using Programmable logic devices and gate arrays.	
41		Digital Integrated Circuits, Different Logic families- TTL, ECL, MOS and CMOS, their operation and specifications.	
42		Digital to analog conversion using resistive ladder.	
43		Analog to Digital conversion: counter /staircase method, Successive approximation;	
44		Accuracy and precision of converters.	
45&46		GATE numericals solved	

Recommended Books:

1. Fundamental of Digital Circuits, A. Anand Kumar, PHI.
2. Digital Logic Design, Morris Mano, PHI.
3. Modern Digital Electronics, 2nd Edition, R.P. Jain. Tata Mc Graw Hill Company Limited.
4. Digital circuits and design, 4th edition, S. Salivahanan & S. Arivazhagan, Vikas Publishing House Pvt. Ltd.
5. Digital Electronics and integrated circuits, 2nd edition, Soumitra Kr. Mandal, Mc Graw Hill Company.

Subject Teacher:

Signature: