

# Course: Digital Electronic Circuits

**Course Code:** noc20-ee32

**Session:** 2019-20

**Duration:** 12 Weeks

**Assessment procedures:** Weekly Assignment (25%) + proctored certification Exam (75%)

## Curriculum of the Course:

**Week 1:** Introduction; Relation between switching and logic operation; Use of Diode and Transistor as switch; Concept of noise margin, fanout, propagation delay; TTL, Schottky TTL, Tristate; CMOS Logic, Interfacing TTL with CMOS

**Week 2:** Basic logic gates, Universality of NAND, NOR gates, AND-OR-Invert gates, Positive and Negative Logic; Boolean Algebra axioms and basic theorems; Standard and canonical representations of logic functions, Conversion between SOP and POS; Simplification of logic functions, Karnaugh Map, Don't Care Conditions

**Week 3:** Minimization using Entered Variable Map, Minimization using QM algorithm; Cost criteria, Minimization of multiple output functions; Static-0, Static-1 and Dynamic Hazards and their cover.

**Week 4:** Multiplexer; Demultiplexer / Decoder, BCD to 7-segment decoder driver; Encoder, Priority encoder; Parity generator and checker

**Week 5:** Number systems-binary, Signed binary, Octal, hexadecimal number; Binary arithmetic, One's and two's complements arithmetic; Codes, Code converters; Adder, Subtractor, BCD arithmetic

**Week 6:** Carry look ahead adder; Magnitude comparator; ALU; Error detecting and correcting codes

**Week 7 :** Bistable latch, SR, D, JK, T Flip-Flop: level triggered, edge triggered, master – slave, Various representations of flip-flops; Analysis and synthesis of circuits that use flip-flop

**Week 8 :** Register, Shift register, Universal shift register; Application of shift register: ring counter, Johnson counter, sequence generator and detector, serial adder; Linear feedback shift register

**Week 9 :** Up and down counter, Ripple (asynchronous) counters, Synchronous counters; Counter design using flip flops, Counter design with asynchronous reset or preset; Applications of counters

**Week 10 :** Design of synchronous sequential circuit using Mealy model and Moore model: state transition diagram, algorithm state machine (ASM) chart; State reduction technique

**Week 11 :** Digital to analog converters: weighted resistor/converter, binary ladder, converter, accuracy and resolution; Analog to digital converter: quantization and encoding, different types of conversion, accuracy and resolution

**Week 12:** Memory organization and operation, Memory expansion; Memory cell; Different types of memory, ROM, PROM, PAL, PLA, CPLD, FPGA

## List of students enrolled

S. No	Name of Student
1	Vishnu Gupta
2	Akash Yadav
3	Abhay
4	Abhishek Jangir

5	Abhishek Kumar Sarang
6	Aditya Gaur
7	Deepak Agrawal
8	Akshay Garg
9	Amit Soni

10	Anil
11	Anju Choudhary
12	Ankit Jonwal
13	Ankush Joshi
14	Ankush Meena
15	Anshul Maurya
16	Anuj Saini
17	Anurag Singh Chauhan
18	Archit Jain
19	Arpit Gangwal
20	Ashish Latiyal
21	Ashish Maheshwari
22	Ashveen Dasaya
23	Ayush Pawar
24	Bharat Kumar
25	Bhavesb Sharma
26	Akshay
27	Chetan Jangid
28	Chetan Prajapat
29	Chitransha Arya
30	Pradhum Malhotra
31	Yash Kumar Sen
32	Deepak Kumar Mahar
33	Devendra Sharma
34	Dipesh Singh
35	Dishant Doriya
36	Dev Gupta
37	Drishti Jain
38	Bhoomika Dubey
39	Gari13
40	Himanshu Goyal
41	Bhagchand Gurjar
42	Harshit Kannariya
43	Harsh Dixit
44	Harshit
45	Harshit Singh
46	Shreya Sharma
47	Himanshu Vijay
48	Hukam Chand Gwala
49	Ishan Gupta
50	Ishika Agrawal
51	Aryan

52	Milind Jalwania
53	Aarambh Jangir
54	Jayesh Verma
55	Tanishk Jharwal
56	Jitendra Agrawal
57	Jasmine Bhatti
58	Aviral Jain
59	John Gulpadiya
60	Jyoti Sharma
61	Karishma Tomar
62	Kaushal Kumar
63	Harsh Khandelwal
64	Mayank Khandelwal
65	Mayank Khandelwal
66	Rakshit Khandelwal
67	Khushal Kumar Sain
68	Kapil Raj Tanwar
69	Gaurav Kumar Khandelwal
70	Harshit Kumawat
71	Yash Verma
72	Lalit Meena
73	Lakshita Shringi
74	Lokesh Kasana
75	Manan Maini
76	Manali Sharma
77	Manju Choudhary
78	Mohit
79	Monika Jareda
80	Megha Sharma
81	Mohit Agrawal
82	Pushpendra Meena
83	Mudit Surana
84	Nakul Singh Jadon
85	Naveen Kumar Verma
86	Nidhi Mahawar
87	Nikhil Chopra
88	Nikhil Singh
89	Nikita Meena
90	Nitesh Jangid
91	Vansh Pradeep Singh Rathore
92	Neha Singh
93	Piyush Pal

94	Pankaj Dhakad Dhakad
95	Paras Sharma
96	Piyush Gupta
97	Pradhuman Chandel
98	Prashu Jain
99	Prince Meena
100	Rahul
101	Rahul Yadav
102	Ratan Soni
103	Rishi Bhargav
104	Ritik Khandelwal
105	Ritik Verma
106	Amisha Jain
107	Lakshit Sharma
108	Rohit Jain
109	Rounak Mathur
110	Rupesh Kumar Yadav
111	Aman Saini
112	Saloni Sharma
113	Sankit Sharma
114	Sarthak Agarwal
115	Madhav Sharama
116	Jatin Sharma
117	Kajal Sharma
118	Yash Kumar Sharma
119	Shreya Meena

120	Shubham Naryani
121	Siddharth Darji
122	Siddharth Rawat
123	Sabhyata Agarwal
124	Amit Yadav
125	Sonika Meena
126	Sourabh Kumawat
127	Ajay Meena
128	Shubham Prajapati
129	Vibhor Bansal
130	Shubham Udsaria
131	Suarj Choudhary
132	Shraddha Tiwari
133	Poorvaja Verma
134	Ujala Jhanwar
135	Umesh Udai
136	Unnati Kumawat
137	Vaibhav Singh Rajpurohit
138	Vansh Agrawal
139	Akshay Verma
140	Vishal Singh
141	Vidushi Pareek
142	Vishal Dhakad
143	Shivam Sharma
144	Vineet Sharma