B. P. Poddar Institute of Management & Technology

Department of Electronics & Communication Engineering

Academic Year: 2025-26

Lesson Plan

Course Name: Digital System Design **Course Code: EC302**

S. No.	Lecture/ Tutorial No.	Topics to be Covered	Text/ References	Teaching Pedagogy*
1.	L1	Familiarization of students with Institute and Department Vision, Mission, PEOs, POs, PSOs, Cos. Course introduction, syllabus overview, digital systems overview	T1	C&T, PPT, CD
2.	L2	Review of number systems: Binary, Octal, Hexadecimal	T1	C&T, PPT, CD, PS
3.	L3	Signed and unsigned number representation	T1	C&T, PPT, CD, PS
4.	L4	Boolean algebra laws and De Morgan's theorem	T1,T2	C&T, PPT, CD, PS
5.	L5	SOP, POS forms and canonical representation	T1,T2	PS, C&T
6.	L6	Karnaugh Map simplification (2–4 variables)	T1,T2,	C&T, PPT, CD, PS
7.	T1	Tutorial: Boolean simplification and K-map problems	T1,T2	C&T, PPT, CD, PS,Q
8.	L7	Binary codes: BCD, Gray code	T1,T2	C&T, PPT, CD, PS
9.	L8	Code conversion techniques	T1,T2	C&T, PPT, CD, PS
10.	L9	Half adder and Full adder	T1,T2	PS, C&T, Q
11.	L10	Parallel adder and BCD adder	T1,T2	C&T, PPT, CD, PS
12.	T2	Tutorial: Adder circuit problems	T1,T2	C&T, PPT, CD, PS,Q

13.	L11	Multiplexers De-multiplexer and their applications	T1,T2, WR1	C&T, PPT, CD
14.	L12	Encoders and Decoders	T1,T2	C&T, PPT, CD, PS
15.	L13	Comparators and barrel shifter	T1,T2	C&T, PPT, CD
16.	T3	Tutorial: Problems on MSI devices	T1,T2	C&T, PPT, CD, PS,Q
17.	L14	Introduction to sequential circuits	T1,T2	C&T, PPT, CD, PS
18.	L15	SR and JK flip-flops	T1,T2	C&T, PPT, CD, PS
19.	L16	Master-slave and edge-triggered flip-flops	T1,T2	PS, C&T
20.	L17	Shift registers	T1,T2, WR2	C&T, PPT, CD, PS
21.	L18	Ripple counters	T1,T2	C&T, PPT, CD, PS
22.	L19	Synchronous counters	T1,T2	C&T, PPT, CD, PS
23.	T4	Tutorial: Flip-flop and counter design problems	T1,T2, WR2	C&T, PPT, CD, PS,Q
24.	L20	Finite State Machine (FSM) concept	T1,T2	PS, C&T
25.	L21	FSM design methodology	T1,T2	C&T, PPT, CD, PS
26.	L22	Pulse train generator and PRBS generator	T1,T2	PS, C&T
27.	L23	Logic families: TTL and ECL	T1,T2	C&T, PPT, CD
28.	L24	CMOS logic family	T1,T2	FC, C&T, PPT, CD, PS
29.	T5	Tutorial: Logic family discussions	T1,T2	C&T, PPT, CD, PS,Q
30.	L25	Semiconductor memories: RAM and ROM	T1,T2	FC, C&T, PPT, CD, PS
31.	L26	Programmable logic devices and FPGA	T1,T2,T3	C&T, PPT, CD, PS
32.	L27	Weighted resistor DAC and R-2R ladder DAC	T1,T2	C&T, PPT, CD, PS
33.	L28	Analog to Digital Conversion techniques	T1,T2	PS, C&T

34.	T6	Tutorial: Problems on DAC and ADC	T1,T2	C&T, PPT, CD, PS,Q
35.	L29	Sample and Hold circuits	T1,T2	C&T, PPT, CD, PS
36.	L30	Introduction to VLSI design flow	T3,T4	C&T, PPT, CD, PS
37.	L31	Introduction to VHDL and modeling styles	T3,T4	C&T, PPT, CD, PS
38.	L32	VHDL dataflow and behavioral modeling	T3,T4	PS, C&T
39.	L33	VHDL for combinational circuits	T3,T4	C&T, PPT, CD, PS
40.	L34	VHDL for sequential circuits	T3,T4	PS, C&T, Q
41.	T7	Tutorial: VHDL coding examples	T3,T4	C&T, PPT, CD, PS,Q
42.	L35	Revision: Combinational circuits	T3,T4	C&T, PPT, CD, PS
43.	L36	Revision: Sequential circuits	T1,T2	C&T, PPT, CD, PS

Text/Reference Books:

T1: R.P. Jain – Modern Digital Electronics
T2: D.V. Hall – Digital Circuits and Systems
T3: Charles Roth – Digital System Design using VHDL
T4: Douglas Perry – VHDL
T5: Schilling & Belove, Digital Integrated Electronics, Tata McGraw Hill,
T6: W.H. Gothmann, "Digital Electronics- An introduction to theory and practice",PHI, 2nd edition ,2006.

Web Resources (WR):

1. **WR1:** http://www.digimat.in/nptel/courses/video/108105113/L31.html
2. **WR2:** https://www.youtube.com/watch?v=z-Rk7ZzpaYs

Teaching Pedagogy:

S. No.	Abbreviation	Full Form
1.	C&T	Chalk & Talk
2.	PPT	Power Point Presentation
3.	CD	Classroom Discussions
4.	Q	Quiz
5.	PS	Problem Solving
6.	FC	Flipped Class

Assessment Methodology:

S. No.	Assessment Type	CO Covered
1.	Presentation	CO1
2.	Report Writing	CO2
3.	Class Test1	CO1, CO2, CO3
4.	Class Test2	CO4, CO5
5.	Quiz	CO1, CO2, CO3, CO4, CO5
6.	Assignment	CO1, CO2, CO3, CO4, CO5
7.	End Semester University Exam	CO1, CO2, CO3, CO4, CO5
8.	End Semester Students' Survey (CO Learning Assessment)	CO1, CO2, CO3, CO4, CO5

Prof. (Dr). Ivy Majumdar