MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

COURSE PLAN

Department	:	INFORMATION & COMMUNICATION TECHNOLOGY
Course Name & code	:	Digital Systems & ICT 2154
Semester & branch	:	III SEM & INFORMATION TECHNOLOGY
Name of the faculty	:	Mrs. Rashmi Naveen Raj
No of contact hours/week:		L: 3, T: 1, P: 0, C: 4

Course Outcomes (COs)

	At the end of this course, the student should be able to:	No. of Contact Hours	Marks
CO1:	Identify the applications of various elements of digital system abstractions	5	10
CO2:	Transform complex Boolean expressions using boolean theorems, K-Map, tabulation methods	16	33
CO3:	Design combinational and sequential logic circuits	24	50
CO4:	Classify different memory devices of a computer	3	7
CO5:			
	Total	48	100

Assessment Plan

Components	Assignments	Sessional Tests	End Semester/ Make-up Examination
Duration	20 to 30 minutes	60 minutes	180 minutes
Weightage	20 % (4 X 5 marks)	30 % (2 X 15 Marks)	50 % (1 X 50 Marks)
Typology of Questions	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation	Knowledge/ Recall; Understanding/ Comprehension; Application	Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation
Pattern	Answer one randomly selected question from the problem sheet (Students can refer their class notes)	MCQ: 10 questions (0.5 marks) Short Answers: 5 questions (2 marks)	Answer all 5 full questions of 10 marks each. Each question may have 2 to 3 parts of 3/4/5/6/7 marks
Schedule	4, 7, 10, and 13th week of academic calendar	Calendared activity	Calendared activity
Topics Covered	Quiz 1 (L 1-6 & T 1-2) **(CO1,2,3)**	Test 1 (L 1-20 & T 1-5) **(CO1,2,3)**	Comprehensive examination covering full syllabus. Students are expected to answer all questions **(CO1-4)**
	Quiz 2 (L **7-15** & T 3-4) **(CO1,2,3)**		
	Quiz 3 (L 16-21 & T 5-7) **(CO1,2,3)**	Test 2 (L 21-30 & T 6-10) **(CO1,2,3)**	
	Quiz 4 (L 22-28 & T 8-9) **(CO1,2,3)**		

Lesson Plan

L. No.	Topics	Course Outcome Addressed
L0	Introduction To course	CO1
L1	Introduction to digital systems. Boolean theorems and properties, truth table, boolean functions	CO2
L2	Minterms,maxterms, canonical and standard forms	CO2
L3	SOP and POS expressions, NAND AND NOR implementation	CO2,CO3
T1	Problems on simplification of the Boolean expressions using Boolean theorems and k-maps and NAND/NOR realization	CO2
L4	K-map method:2-variable and 3-variable, 4-variable	CO2
L5	Simplification to SOP and POS using k-map with DON'T CARES	CO2
L6	5-VARIABLE K-MAP	CO2
T2	Additional poroblems on k-maps	CO2
L7	Tabulation method	CO2

L8	Problems on tabulation method	CO2
L9	Introduction to BCD codes	CO1
T3	Tabulation with don't cares	CO2
L10	Code converter design	CO2,CO3
L11	Code converter design	CO2,CO3
L12	Half adder, Full adder, Parallel adder	CO3
T4	Applications of 7483 IC	CO3
L13	Multiplier design using adders	CO3
L14	Half subtractor, Full subtractor and 4-bit adder/subtractor	CO3
L15	Multilevel NAND AND NOR circuts	CO3
T5	Applications of 7483 in single digit bcd adder, cascading of bcd adders	CO1,CO3
L16	Carry look ahead adder	CO1,CO3
L17	Magnitude comparator	CO1,CO3
L18	Design of decoders without enable and with active high and active low output, Design of decoders without enable and with active high and active low output.	CO3
T6	Problems on combinational circuits using 7483 IC and 7485 IC	CO3
L19	Design of higher order decoders using lower order decoders, combinational circuits design using decoders.	CO3
L20	Design of multiplexers with and without enable, higher order mux using lower order mux	CO3
L21	Combinational circuits using 74157 ICs,74153 ICs, 74151 ICs. De-Multiplexers	CO1,CO3
T7	74138 IC and applications, encoders	CO1,CO3
L22	Design of NAND latch, NOR latch, SR flip flop, D flip flop. Excitation table, characteristic equation.	CO3
L23	JK flip flop, T flip flop, excitation table, and characteristic equation	CO3
L24	Master slave FFs , negative and positive edge triggered flip flops. Asynchronous inputs	CO3
T8	Problems on Flip flop design and conversion	CO3
L25	Asynchronous counter design.	CO3
L26	Asynchronous counter design using 7490 IC and 7493 ICs	CO3
L27	Synchronous counter design	CO2,CO3
T9	Applications of 7490 IC and 7493 ICs	CO1,CO3
L28	Synchronous counter design	CO2,CO3

L29	Shift registers, Shift register counters: ring counter, Johnson counter (Twisted ring counter)	CO3
L30	Sequence generator circuit design	CO2,CO3
T10	Applications of 74193 IC	CO1,CO3
L31	Sequence detector design for one sequence	CO2,CO3
L32	Sequence detector design for one sequence-overlapping	CO2,CO3
L33	Sequence detector design for two sequence-overlapping	CO2,CO3
T11	Applications of 74193 ICs, universal shift register	CO1,CO3
L34	Introduction to PLDs	CO4
L35	Combinational circuit design using ROMs, Programmable Array Logic (PAL).	CO2,CO4
L36	Combinational corcuits using PLA	CO2,CO4
T12	Applications and advancements in PLDs	CO4
L/T		

References:

1. M. Morris Mano: Digital Design, Third Edition, Prentice Hall India, 2013.
2. Ronald J. Tocci and Neal S. Widmer : Digital Systems, 9th Edition, Pearson Education, 2007.
3. J.F.Wakerly, Digital Design Principles and Practices, 3rd edition, Pearson Education, 2003
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Submitted by: RASHMI N. R.

(Signature of the faculty)

Date: 27-07-2019

Approved by: DR. BALACHANDRA

(Signature of HOD)

Dr. Balachandra
Professor & Head
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Date: 27-07-2019

FACULTY MEMBERS TEACHING THE COURSE (IF MULTIPLE SECTIONS EXIST):

FACULTY	SECTION	FACULTY	SECTION
Divya S.	A		
Rashmi N. R	B		

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