

HINDUSTHAN

COLLEGE OF ENGINEERING AND TECHNOLOGY

Approved by AICTE, New Delhi, Accredited with 'A' grade by NAAC
(An Autonomous Institution, Affiliated to Anna University, Chennai)
Coimbatore - 641 032.



Academic Year : 23-24 ODD

Semester : III

Class & Branch : II / CHEMICAL

Course Code & Title : 22CH3251 / MECHANICAL OPERATIONS

SUBJECT RECORD

(ATTENDANCE AND ASSESMENT RECORD)

FACULTY NAME : Mr. S. NAGUL DEV

DEPARTMENT : CHEMICAL ENGG.

Programme	Course Code	Name of the Course	L	T	P	C
B.TECH.	22CH3251	MECHANICAL OPERATIONS	2	0	2	3

The student should be able to

- | | | |
|------------------|----|--|
| Course Objective | 1. | Understand the basic information and the systematic diagrams of Unit operations involved in Chemical industries. |
| | 2. | Apply the concepts of design, operation details and schematic of industrial equipment |
| | 3. | Choose the right separation technology for easy separation of chemical components |

Unit	Description	Instructional Hours
I	INTRODUCTION TO PARTICULATE SOLIDS: Particle Size, Size Analysis - Various Mean Diameters - Screen Analysis Standard Screens - Various Industrial Screens. Sieve analysis.	6+3
II	SIZE REDUCTION: Principles of Comminution - Energy and Power Requirements in Comminution - Mechanical Equipment - Laws of Crushing-Size Reduction Equipment - Crushers- Grinders Cutting Machines - Open and Closed Circuit Operation. Reduction ratio in Jaw Crusher, Ballmill, Drop Weight Crusher.	6+4
III	PARTICLE SEPARATION : Gravity settling, sedimentation, thickening, elutriation, double cone classifier, rake classifier, bowl classifier. Centrifugal separation - continuous centrifuges, super centrifuges, design of basket centrifuges; industrial dust removing equipment, cyclones and hydro cyclones, electrostatic and magnetic separators, heavy media separations, floatation, jigging: Characteristics of batch Sedimentation, Separation characteristics of Cyclone separator, Air Elutriator.	6+4
IV	FILTRATION: Theory of filtration, Batch and continuous filters, Flow through filter cake and filter media, compressible and incompressible filter cakes, filtration equipment - selection, operation and design of filters and optimum cycle of operation, filter aids. Batch filtration studies using Leaf Filter and Plate and Frame Filter press.	6+4
V	MIXING: Concept of mixing, Homogeneous and Heterogeneous mixtures, importance of mixing, Mixing liquids with liquids, Mixing of gases with liquids, Mixing of solids with liquids, Mixing of viscous and plastic masses, Types of mixers.	6

Total Instructional Hours 30+15=45

Course Outcome	CO1	Understand the general characteristics of solids, screening and sieve analysis.
	CO2	Examine the particle size reduction processes and to operate the size reduction equipment
	CO3	Illustrate the methods of particles separation
	CO4	Remember the theory of filtration and filtration equipment
	CO5	Estimating the particle handling and the power required for mixing.

TEXT BOOK:

- T1 McCabe, W.L., Smith, J.C., and Harriot, P., "Unit Operations in Chemical Engineering", 7th Edn., McGraw-Hill, 2005.
- T2 Coulson, J.M. and Richardson, J.F., "Chemical Engineering" Vol. I, 5th Edn., Asian Books Pvt. Ltd., India, 2006.
- T3 Patil K.D., Mechanical Operations (Fundamental Principles and Applications), 3rd ed., Nirali Prakasam, India, 2012

REFERENCES:

- R1 Brown G.G., et al., "Unit Operations", 1st edition., CBS Publisher, New Delhi, 2005.
- R2 Badger W.L. and Banchero J.T., "Introduction to Chemical Engineering", Tata McGraw Hill, 1st Edition, 2002.
- R3 Foust, A. S., Wenzel, L.A., Clump, C.W., Naus, L., and Anderson, L.B., "Principles of Unit Operations", 2nd Edn., John Wiley & Sons, 2008.
- R4 Narayanan C.M., Bhattacharya B.C., Mechanical Operations for Chemical Engineers, 3rd ed., Khanna Publishers, India, 2011.

Chairman, Board of Studies
Chairman - BOS
OHE - HiCET



Dean - Academics
Dean (Academics)
HiCET

Name : S. NAGUL DEV

Designation : AP

Department : CHEMICAL ENGGT.

Academic Year : 23-24 (ODD) Semester : III

Class & Branch : II / CHEMICAL

Course Code & Title : 22CH3251 / MECHANICAL OPERATION

Date of Opening : 30/8/23

Last Working Day : 22/12/23

Total Classes Handled : 31 hrs

Date :

Internal Test I : 31/10/23

Internal Test II : 7/12/23

Midterm Test :

Internal Test III :

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Reg.No.	Name	Date														
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	720722114001 ABDUL AZIZ . K	a	a	a	a	a	/	/	/	/	/	/	/	/	/	
2	02 ABINESH . R	a	a	/	/	/	/	/	/	/	/	/	/	/	/	
3	03 ABISHEK PRABHU . P	a	a	/	/	/	/	/	/	/	/	/	/	/	/	
4	04 AIKSHAV . M	a	a	a	a	/	/	/	/	/	a	/	a	/	/	
5	05 ALTEN REY . V	a	a	/	/	/	/	/	/	/	/	/	/	/	/	
6	06 ANBARASAN . K	a	a	/	a	a	/	a	a	/	a	a	a	/	/	
7	07 ANBUSELVAN . K	a	a	/	/	/	/	/	/	/	/	a	a	a	/	
8	08 ANEETA DAS . T	a	a	a	/	/	/	/	/	/	/	/	/	/	/	
9	09 ANOOP . S	a	a	a	a	/	a	/	/	/	/	/	/	/	/	
10	10 ANTON VIBIN . G	a	a	/	/	/	/	/	/	/	/	a	a	/	/	
11	11 BALAJI . D	a	a	/	/	/	a	/	a	/	a	/	/	/	a	
12	12 BELLWIN RAI . P	a	a	a	/	/	a	/	/	/	/	/	/	/	/	
13	13 DEEPAK . P	/	/	/	/	/	/	/	/	/	/	/	/	a	/	
14	14 DHARSHINI . AY	a	a	/	/	/	/	/	/	/	/	/	/	/	/	
15	15 FADL FAISAL MOHAMMED	a	a	/	/	/	/	/	/	/	/	/	a	/	/	
16	16 FAYAS AHAMED . S	a	a	a	a	/	a	/	a	/	a	/	/	/	/	
17	17 GANGADHARAN . K	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
18	18 GOKUL . D	/	/	/	a	/	/	/	/	/	/	a	/	/	/	
19	19 GOPIKRISHNAN . PU	a	a	a	/	/	/	/	/	/	/	a	/	/	/	
20	20 HARIMARAN . S	/	/	/	/	/	/	/	/	/	/	/	/	/	/	
21	21 HIJAZ AL FAZER . A	a	a	/	a	/	a	/	/	/	/	/	/	/	/	
22	22 JOTHIKRISHNAN . N	/	/	/	/	/	a	/	/	/	/	/	/	/	/	
23	23 KRISHNA PRABAKARAN . M	a	a	/	/	/	/	/	/	/	/	/	/	/	/	
24	24 LOGESH . K	a	a	/	/	/	/	/	/	/	a	/	/	/	/	
25	25 MADHUMITHA . S	/	/	/	/	/	/	/	/	/	/	/	/	/	/	

Assignment / Tutorial Marks					Overall Marks for Assignment 5	Internal Test				Overall Weightage for test 10 Marks	Overall Weightage for Mid Sem 5 Marks	% of Attendance for			Overall Marks for Attendance 5	Internal Marks 20 Marks
1	2	3	4	5		Test - I 30 Marks	Test - II 30 Marks	MidTerm 100 Marks	Test - III 50 Marks			Test - I	Test - II	Test - III		
1	15	20				50	-			15					35	1
2	20	20				81	55			41					44	2
3	17	20				64	60			37					42	3
4	14 20	20				26	24			28					33	4
5	20	20				78	73			45					45	5
6	16	20				AB	50			15					31	6
7	15	20				63	60			37					42	7
8	18	20				50	58			32					40	8
9	17	20				54	67			36					41	9
10		20				5	8			17					33	10
11	15	20				57	56			34					39	11
12	17	20				74	76			45					45	12
13	18	20				50	56			32					41	13
14	19	20				71	78			45					45	14
15	14	20				55	64			36					40	15
16	13	20				23	2			23					33	16
17	20	20				72	56			38					43	17
18	20	20				74	70			43					46	18
19	15	20				45	53			29					39	19
20	18	20				80	69			45					45	20
21	10	20				43	11			29					36	21
22	16	20				50	58			32					40	22
23	20	20				50	50			30					40	23
24	18	20				60	50			33					39	24
25	12	20				61	57			35					41	25

7

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Subject

Reg.No.	Name	Date																
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
		Month	8	9	9	9	9	9	9	9	9	10	10	10	10	10		
Hour	2	5	3	2	3	2	2	6	7	3	2	6	3	2				
26	726722114026	MOHAMMED FAIZEL.M	a	a	/	/	a	a	a	a	/	/	a	/	a	/	a	/
27	27	MOHAMMED HANEEN.M	a	a	/	/	a	/	/	/	/	/	/	/	/	/	/	/
28	28	MOHAMMED RIVASUDEEN.S	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a
29	29	MOHAMMED SHALU.VP	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
30	30	MUHAMMED SHAMEEM.K	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
31	31	MUHAMMED SIDHAN.AK	a	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/
32	32	MURUGIANAYAGAM.S	/	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
33	33	NANDHAKISHOR.C	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
34	34	NARENDHIRAN.M	/	/	/	/	/	/	a	a	/	/	/	/	/	/	/	/
35	35	NAVEENKUMAR.D	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
36	36	PADMA PRIYA.RS	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
37	37	PATCHAMUTHU.M	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
38	38	PRITHIVIRAJ.C	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
39	39	RAGHAV.R	a	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/
40	40	RAGIUL RAJ.M	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
41	41	RAHIL AHMED.M	/	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
42	42	RINS.TN	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
43	43	RUBAN DURAI.E	a	a	/	/	a	a	a	a	/	/	/	/	/	/	/	/
44	44	SAKTHI GURHAN	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
45	45	SANJANA.S	a	/	a	/	/	/	/	/	/	/	/	/	/	/	/	/
46	46	SARAN GEETHAN.L	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
47	47	SATHISKUMAR.A	a	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/
48	48	SHARUN.M	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/
49	49	SIVARAHAN.S	/	/	/	a	/	/	a	a	/	/	/	/	/	/	/	/
50	50	SRIKANTH.M	a	a	/	/	/	/	/	/	/	/	/	/	/	/	/	/

Assignment / Tutorial Marks					Overall Marks for Assignment 5	Internal Test				Overall Weightage for test 60 Marks	Overall Weightage for Mid Sem 5 Marks	% of Attendance for			Overall Marks for Attendance 5	Internal Marks 25 Marks
1	2	3	4	5		Test - I	Test - II	MidTerm	Test - III			Test - I	Test - II	Test - III		
						20 Marks	50 Marks	100 Marks	50 Marks							
16	20					18 31				16					31	26
17	20					59	54			34					39	27
17	20					-	-			-					-	28
16	20					43	50			28					39	29
15	20					24 37				24					37	30
20	20					6	58			19					35	31
20	20					4	50			16					35	32
19	20					52	53			32					41	33
20	20					50	31			24					37	34
14	20					24	43			22					36	35
18	20					68	72			42					44	36
20	20					67	73			42					44	37
13	20					55	56			33					42	38
19	20					50	56			32					40	39
17	20					55	52			32					40	40
18	20					76	73			44					45	41
19	20					50	59			33					40	42
18	20					51	50			20					39	43
18	20					51	24			23					36	44
19	20					79	86			50					46	45
18	20					62	58			36					42	46
17	20					50	52			31					40	47
17	20					36 15				20					35	48
18	20					85	54			34					40	49
12	20					54	21			23					37	50

Subject

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Reg.No.	Name	Date	31	2	4	7	11	14	21	23	29	25	31	7	12	15	
		Month	8	9	9	9	9	9	9	9	9	10	10	10	10	10	10
		Hour	2	6	3	2	9	2	1	2	6	3	2	6	3	2	6
51	720722114051 SRINITHI . S		/	/	/	/	/	/	/	/	/	/	/	/	/	/	
52	52 SRIRAM . M		a	a	/	/	/	/	a	a	/	/	/	/	/	/	
53	53 SUBASHINI . S		a	a	/	/	/	/	/	/	/	/	/	/	/	/	
54	54 SULOESHANA . S		/	/	/	a	/	a	/	/	/	/	a	a	/	/	
55	55 SURIYA . S		a	a	/	/	/	/	a	a	/	/	a	/	/	/	
56	56 VAISHALI . B		a	/	/	/	/	/	/	/	/	/	/	/	/	/	
57	57 VISHWA . B		a	a	a	/	/	/	a	a	/	/	a	/	/	/	
58	58 YUVARAJ . B		a	a	/	/	/	/	/	/	/	/	a	/	/	/	
59	806 PRASANTH . K		/	a	/	/	/	/	/	/	/	/	a	a	a	a	
60	801 ABISHEK . E		a	a	/	/	/	/	/	/	/	/	a	/	/	/	
61	807 SHAM SUNDER . B		/	/	/	/	/	/	/	/	/	/	a	/	/	/	
62	804 MAHESH SARAN . S		a	/	/	a	a	a	/	/	/	/	/	/	/	/	
63	808 SIVA SURIYA		a	a	/	/	/	/	/	/	/	/	/	/	/	/	
64	803 GOWTHAMAN . K		/	/	/	/	/	/	/	/	/	/	/	/	/	/	
65																	
66	805 MOHAMMED SHAHNADA		a	a	a	a	/	/	/	/	/	/	/	/	/	/	
67	802 FASIL SHEREEF . KP		a	a	a	a	/	/	/	/	/	/	/	/	a	a	
68																	
69	Total no of student - 67		67	67	67	67	67	67	67	67	67	67	67	67	67	67	
70	Absent		48	48	16	13	11	9	15	15	1	1	12	11	12	8	
71	Present		19	19	51	54	56	58	52	52	66	66	55	56	55	59	
72	Signature																
73																	
74																	
75																	

Assignment / Tutorial Marks					Overall Marks for Assignment 5	Internal Test				Overall Weightage for test 10 Marks	Overall Weightage for Mid Sem 5 Marks	% of Attendance			Overall Marks for Attendance 5	Internal Marks 30 Marks
1	2	3	4	5		Test - I 100 Marks	Test - II 100 Marks	Midterm 100 Marks	Test - III 50 Marks			Test - I	Test - II	Test - III		
18	20					50	54			31					40	51
18	20					50	35			26					37	52
19	20					69	65			40					44	53
19	20					77	72			45					45	54
16	20					54	70			37					42	55
19	20					91	93			55					48	56
17	20					61	45			32					40	57
16	20					57	50			32					40	58
14	20					50	60			38					40	59
17	20					59	66			29					41	60
20	20					52	51			30					39	61
18	20					54	50			31					41	62
18	20					58	64			37					42	63
20	20					72	76			44					44	64
—	—					—	—			—					—	65
16	20					62	64			39					42	66
16	20					54	32			26					39	67
																68
																69
																70
																71
																72
																73
																74
																75
TOTAL NO. OF STUDENTS						66	65									
PRESENT						63	64									
ABSENT						02	01									
FAILURES						11	14									
PASS %						82.5%	78.25%									
HOD SIGN																

LESSON PLAN

S.No.	Date / Class Handled	Date / Class Handled	Topic Covered	Teaching Method	Teaching Aide	Remarks
			<u>UNIT-I</u>			
1	31/8/23	2	Particle shape, Size	L	PPT, BB	
2	2/9/23	5	Mixed Particle Sizes, Size analysis	BB	C&T	
3	4/9/23	3	Cumulative & Differential Analysis			
4	7/9/23	2	Various Mean Diameter	Videos	PPT	
5	11/9/23	3	Screen Analysis, Std. Sizes	Videos	BB	
6	14/9/23	2	Various Industrial Screens	C&T	BB	Flipped class room
			<u>UNIT-II</u>			
7	21/9/23	1	Principles of Comminution	Videos	BB	
8	21/9/23	2	Energy and Power requirements in Mech.	C&T	BB	
9	23/9/23	6	Law of Crushing, Size Reduction	Videos	PPT, BB	

LESSON PLAN

S.No.	Date / Class Handled	Date / Class Handled	Topic Covered	Teaching Method	Teaching Aide	Remarks
10	23/9/23	7	Crushers, Grinders	Videos	PPT	
11	25/9/23	3	Cutting Machines, open vedha operation		Quiz	
12	5/10/23	2	Closed operation	"	Edupuzzle	
UNIT - III						
13	7/10/23	6	Gravity Settling, Sediment Thickening, Elutriat ⁿ	Videos	Google Slides	
14	9/10/23	3	Double Cone Classifier } Cake, bowl Classifier }	CBT	BB	
15	12/10/23	2	Centrifugal Separat ⁿ } Continuous Centrifuges }	"	"	
16	14/10/23	6	Design of basket, } Industrial dust equipment }	"	"	
17	14/10/23	7	Cyclones & Hydrocyclones } ESP }	Videos	PPT	
18	25/10/23	3	Heavy Media Separat ⁿ } Sizing }	"	"	

LESSON PLAN

S.No.	Date / Class Handled	Date / Class Handled	Topic Covered	Teaching Method	Teaching Aide	Remarks
			<u>UNIT - IV</u>			
19	2/11/23	2	Theory of Filterat ⁿ , Batch & Continuous	CYT	PPT	
20	4/11/23	6	Flow through Filter Cake & Filter media	Videos	PPT BB	
21	6/11/23	3	Filter media	CYT	BB	
22	9/11/23	2	Compressible, Incompressible filter cakes, equipments	Videos	PPT	
23	22/11/23	6	Select ⁿ , operat ⁿ design of filters	BB	CYT	
24	22/11/23	7	Optimum Cycle of operat ⁿ filter aids	11	11	
			<u>UNIT - V</u>			
25	23/11/23	1	Concept of Mixing, Homogeneous & Heterogeneous Mixing	11	11	

SPECIAL ACADEMIC ACTIVITIES ORGANISED

Date	Topic	Event	Remarks on Student Performance
17/10/23	Unit of earth Chemical Engs in Cement Industry	Seminar	Good
8/11/23	Plate and Frame Press	Assignment	-

Event: Industrial Visits / Guest Lectures / Workshops / Mini - Projects / Seminars / Assignments, etc.
(Additional sheet may be attached as necessary)

STUDENT'S COUNCELLING RECORD

Anbarasan. K has advised to come to class regularly and given the Important question for Internal-II, which helps him to Pass in Internal-II.


Signature of Dear

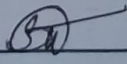
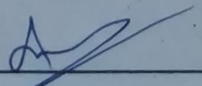
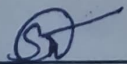
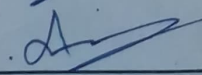
CLASS TIME TABLE

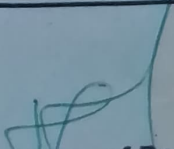
Day	PERIOD						
	1	2	3	4	5	6	7
Monday	22CH3202	22ME3253	22CH3251	22MA3107	← 22CH3001 →		
Tuesday	22CH3203	22MA3107	22CH3201	22CH3202	22CH3202	22CH3203	22ME3253
Wednesday	← 22ME3253 →	22CH3201	22MA3107	22CH3201	← 22CH3251 →		
Thursday	11B.	22CH3251	22CH3203	22MC30A1	22MA3107	22CH3202	SEM
Friday	22ME3253	22CH3201	22MA3107	22CH3203	← 22CH3002 →		
Saturday	SEM	22CH3202	22CH3203	22CH3201	22MC30A1	22CH3251	TWM

INDIVIDUAL TIME TABLE

Day	PERIOD						
	1	2	3	4	5	6	7
Monday			22CH3251				
Tuesday							
Wednesday							
Thursday		22CH3251					
Friday							
Saturday						22CH3251	

RECORD OF INSPECTION

Sl.No.	Date of Inspection	Signature of Staff	Signature of HOD
1	10/10/23		
2	8/12/23		


Signature of Dean

VISION

“ To become a premier institution by producing professionals with strong technical knowledge, innovative research skills and high ethical values”.

MISSION

To provide academic excellence in technical education through novel teaching methods.

To empower students with creative skills and leadership qualities.

To produce dedicated professionals with social responsibility.

Dr.APJ Abdul Kalam's Oath for Teachers

1. **First and foremost, I will love teaching. Teaching is my soul.**
2. **I realize that I am responsible for shaping not just students but ignited youths who are the most powerful resource under the earth, on the earth and above the earth. I will be fully committed for the great mission of teaching.**
3. **I will consider myself to be a great teacher, only when I can, lifts the students average to the best performance by way of my special teaching.**
4. **All my actions with my students will be with kindness and affection, like a mother, sister, father and brother.**
5. **I will organiz and conduct my life, in such a way that my life itself as message for my students.**
6. **I will encourage my students to ask questions and develop the spirit of inquiry,. so that they blossom in to creative enlightened citizens.**
7. **I will treat all the students equally and will not support any differentiation on account of religion, community or language.**
8. **I will continuously build the capacities in teaching so that I can impart education to my students.**
9. **I will celebrate the success of my students, with great Elan.**
10. **I realize by being a teacher, I am making an important contribution to all the National Development Activities.**
11. **I will continuously endeavour to fill my mind, with great thoughts and spread the nobility in thinking and action.**

HINDUSTHAN
COLLEGE OF ENGINEERING AND TECHNOLOGY
(An Autonomous Institution, Affiliated to Anna University, Chennai)
Coimbatore- 641 032



Academic Year : 2023-24 Semester : III
Class & Branch : II - BME
Course Code & Title : 22BM3251 - DIGITAL ELECTRONICS

THEORY COURSE RECORD

(ATTENDANCE AND ASSESSMENT RECORD)

FACULTY NAME : Ms. VANISHRI
DEPARTMENT : BIOMEDICAL ENGINEERING

Programme	Course Code	Name of the Course	L	T	P	C
B.E.	22BM3251	Digital Electronics	2	0	2	3

Course Objective

- To understand the number systems and simplification of Boolean functions
- To Confer the basic principles combinational circuits
- To learn synchronous sequential circuits
- To recognize asynchronous sequential circuits
- To know about Memory devices and fundamentals of HDL.

Unit	Description	Instructional Hours
	NUMBER SYSTEMS AND MINIMIZATION TECHNIQUES	
I	Number systems: Decimal, Binary, Octal, Hexadecimal-Number-Base conversion-Complements of Numbers: 1's and 2's complements- Boolean algebra and laws-De-organ's Theorem-Minimization of Boolean expressions – Midterm – Maxterm – Sum of Products (SOP) – Product of Sums (POS) – Karnaugh map Minimization– Don't care conditions (2-variable,3-variable & 4-variable)-Tabulation method	9
	COMBINATIONAL CIRCUITS	
II	Adder-Half adder, Full adder; Subtractor- Half subtractor, Full subtractor: Code converters: Binary to Gray, Gray to Binary, BCD to Excess-3 and Excess-3 to BCD; Magnitude comparator- Decoders, Encoders,-Multiplexers, De multiplexers, Experimental Design and implementation of Adders and Subtractors.	9
	Experimental Design and implementation of Binary to Gray and Gray to Binary Conversion.	
	Experimental Design and implementation of Decoder and Encoder	
	SYNCHRONOUS SEQUENTIAL CIRCUITS	
III	Flip flops: SR, JK, D, T - Design of synchronous sequential circuits: State diagram - State table, – State minimization - State assignment. Shift registers: SISO, SIPO, PIPO, PISO– Counters: BCD, Up down counter and modulo counter.	9
	Experimental Design and implementation of Shift registers, Synchronous and Asynchronous Counters	
	ASYNCHRONOUS SEQUENTIAL CIRCUITS	
IV	Stable and Unstable states– Cycles and Races-Reduction of state and flow tables – Race-free state assignment – Hazards-Design of Hazard free circuits	9
	MEMORY DEVICES AND HDL	
V	ROM-PROM-EPROM-EEPROM-RAM-FPGA-Programunable Logic Devices-Introduction to Hardware Description Language (HDL)- HDL for combinational circuits- Half adder, Full adder, Multiplexer, De-multiplexer, Counters..	9
	Coding Combinational/Sequential circuits using HDL.	

Total Instructional Hours 45

Course Outcome	Description
CO1	Simplify Boolean functions
CO2	Analyze, design and implement combinational logic circuits.
CO3	Evaluate, design and implement Synchronous sequential logic circuits
CO4	Interpret, design and implement Asynchronous sequential logic circuits
CO5	Simulate and implement combinational and sequential circuits using HDL.

Name : VANISHRI
Designation : ASSISTANT PROFESSOR.
Department : BIOMEDICAL ENGINEERING

Academic Year : 2023-24 Semester : ODD

Branch : BIOMEDICAL ENGINEERING

Subject Code & Titles : 22BM3251 - DIGITAL ELECTRONICS

Subject Title : DIGITAL ELECTRONICS

CO Target

Date of Opening : 21/08/2023

Last Working Day : 16/12/2023

Date

Internal Test I : 01/11/2023

Internal Test II : 08/12/2023

Midterm Test :

Internal Test III :

Reg. No	Name	Date															
		Month															
		Hour															
1	720722112001	ABDUSSAMAD . O	a	a	/	/	/	/	/	/	/	/	/	/	/	/	1
2	720722112002	ABINESII JOVITER KASTON . K	a	a	/	/	/	/	/	/	/	/	/	/	/	/	2
3	720722112003	AJITH KUMAR . A	a	a	/	/	/	/	/	/	/	/	/	/	/	/	3
4	720722112004	AMAL DEV	a	a	/	/	/	/	/	/	/	/	/	/	/	/	4
5	720722112005	AMBILI P.C.	a	/	/	/	/	/	/	/	/	/	/	/	/	/	5
6	720722112006	ANBUMANI T	a	a	/	/	/	/	/	/	/	/	/	/	/	/	6
7	720722112007	ARAVINTH KUMAR . P	a	a	/	/	/	/	/	/	/	/	/	/	/	/	7
8	720722112008	ARCHANA BENNY	a	a	/	/	/	/	/	/	/	/	/	/	/	/	8
9	720722112009	ARSATHI PARVEZ . M	a	a	/	/	/	/	/	/	/	/	/	/	/	/	9
10	720722112010	ASMA . V	a	/	/	/	/	/	/	/	/	/	/	/	/	/	10
11	720722112011	BALAJI . A	/	/	/	/	/	/	/	/	/	/	/	/	/	/	11
12	720722112012	BARATHI SUKUMAR . E	a	a	/	/	/	/	/	/	/	/	/	/	/	/	12
13	720722112013	BASIL . K.V	a	/	/	/	/	/	/	/	/	/	/	/	/	/	13
14	720722112014	BASKAR . T	a	a	/	/	/	/	/	/	/	/	/	/	/	/	14
15	720722112015	DEEPA . S	/	/	/	/	/	/	/	/	/	/	/	/	/	/	15
16	720722112016	DHANUSH . M.	a	a	/	/	/	/	/	/	/	/	/	/	/	/	16
17	720722112017	DHILAK . S.	a	a	/	/	/	/	/	/	/	/	/	/	/	/	17
18	720722112018	DINESH KARTHIK . T	a	a	/	/	/	/	/	/	/	/	/	/	/	/	18
19	720722112019	GUNASEKARAN . D	a	/	/	/	/	/	/	/	/	/	/	/	/	/	19
20	720722112020	HRITHIK T.K.	a	/	/	/	/	/	/	/	/	/	/	/	/	/	20
21	720722112021	JAGADHEESH . M.	/	/	/	/	/	/	/	/	/	/	/	/	/	/	21
22	720722112022	JAMAL AL JAZEER . K	a	a	/	/	/	/	/	/	/	/	/	/	/	/	22
23	720722112023	JANAPRIYA . S.	/	/	/	/	/	/	/	/	/	/	/	/	/	/	23
24	720722112024	JEEVITHA . S.	/	/	/	/	/	/	/	/	/	/	/	/	/	/	24
25	720722112025	JOHN NICKSHAN . C	/	/	/	/	/	/	/	/	/	/	/	/	/	/	25
26	720722112026	KALAIVANI . G.	/	/	/	/	/	/	/	/	/	/	/	/	/	/	26
27	720722112027	KARTHICK . C.	a	/	/	/	/	/	/	/	/	/	/	/	/	/	27
28	720722112028	KRISHNA MOORTHY . A	a	a	/	/	/	/	/	/	/	/	/	/	/	/	28
29	720722112030	LAKSHMAN . G.	a	/	/	/	/	/	/	/	/	/	/	/	/	/	29
30	720722112031	MANIMALA . N.	/	/	/	/	/	/	/	/	/	/	/	/	/	/	30

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Reg. No	Name	Date																							
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		Hour																							
		30	2	1	5	4	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	720722112032	MAYURA GURU BARAN. S	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	720722112033	MOHAMMED ASMAH	a	1	1	1	1	a	a	a	1	a	1	1	1	1	1	1	1	1	1	1	1	1	1
3	720722112034	MOHAMMED YASAR K.P.	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
4	720722112035	MOHAMMED ANSHAB	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	720722112036	NANDHITHA .T	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
6	720722112037	NAVEEN. A	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
7	720722112038	NEHAL KRISHNA V.T.	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	720722112039	NELVIN JINS	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9	720722112040	NOOPU . AD.	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10	720722112041	PRATHAN . P.K.	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
11	720722112042	PREETHVI . P.	a	1	1	1	1	1	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
12	720722112043	PREM KUMAR . S	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
13	720722112044	PRITHIVI RAT . P.	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
14	720722112045	RACHEL . R.	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	720722112046	REVATHY P. R.	a	1	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
16	720722112047	RISHIKESAN . K.	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
17	720722112048	RUVETHASRI . V	1	1	1	1	1	1	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
18	720722112049	SABARINATH . M	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
19	720722112050	SHAHZAD ROSHAN P.K	a	1	1	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20	720722112051	SHANMUGA RATA . G.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
21	720722112052	SHANDOB SHAJAHAN	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
22	720722112053	SHYAM MOHITH SOKUNAR	a	a	1	1	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
23	720722112054	SUFYAN M.K.	a	1	1	1	a	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
24	720722112055	SHHAIL . P.V.	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
25	720722112056	SUREKA . M	1	1	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
26	720722112057	SURYA . P.	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
27	720722112058	SUSITHARAN . S	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
28	720722112059	THALAL MOHAMED . S.	a	a	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	720722112060	THIVAGAR . K.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	720722112061	UTHAYAVANAN . N. M.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

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	Test	Test 1	Midterm	Test 2			Internal Marks
	91	96					
	57	70					
	85	92					
	50	63					
	52	35					
	97	78					
	50	61					
	53	28					
	54	36					
	50	69					
	39	5					
	24	50					
	69	82					
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	69	0					
	57	76					
	69	74					
	52	25					
	50	52					
	0	86					
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LESSON PLAN

S.No.	Date Class Handled	Topic Covered	Period of Lecture	Remarks
1.	30/8/2023 (5)	Introduction	Lecture	Black board
2.	2/9/2023 (3)	Number system, 1's & 2's complement	Lecture	Black board
3.	4/9/2023 (1)	Boolean algebra law	Lecture	black board
4.	5/9/23 (3)	Mnemonicization of Boolean law	Lecture	black board
5.	7/9/23 (5)			
6.	11/9/23 (1)	sum of products	Video	Smart board
7.	12/9/23 (3)	Problem in sop	Lecture	black board
8.	12/9/23 (7)	Problems in sop.	Lecture	black board
9.	13/9/23 (5)	Product of sum	Lecture	black board
10.	19/9/23 (7)	K-map - 2, & 3 variable	Lecture	black board
11.	25/9/23 (1)	Mnemonicization - bit care conditions.	Lecture	black board
12.	26/9/23 (3)	Problems	Lecture	black board
13.	27/9/23 (5)	Verification of Logic Gates	Video	Smart board
14.	3/10/23 (3)	Canonical POS & SO	Lecture	black board
	(7)	SO	Lecture	black board
15.	4/10/23 (5)	Problem don't care	Video	Smart board
16.	9/10/23 (1)	Class test		
17.	10/10/23 (3)	Tabulation Method.	Lecture	black board
18.	10/10/23 (7)	Problem	Lecture	black board
19.	14/10/23 (3)	Unit-2 Adder, Subtractor	Lecture	black board
20.	25/10/23 (5)	Full subtractor	Video	Smart board
21.	6/11/23 (1)	Problems	Video	Smart board
22.	14/11/23 (3)	Magnitude comparator BCD adder.	Lecture	black board

Signature of HOD

LESSON PLAN

S.No.	Date Class Handled	Topic Covered	Period of Lecture	Remarks
23.	14/11/23 (7)	Decoder, Encoder MUX & DEMUX	Lecture	black board
24.	16/11/23 (1)	unit-3 sequential circuits EP	Lecture	black board
25.	20/11/23 (1)	FFS, RS EP JK FFS.	Lecture	black board
26.	21/11/23 (7)	J, D, FF, shift Reg & T..	Lecture	black board
27.	22/11/23 (5)	Types of shift Reg SISO,	Lecture	black board
28.	2/12/23 (1)	SIPD, PISO, PIPD	Lecture	black board
29.	3/12/23 (4)	counters:- BCD, Up, down, modulo counters.	PPT	Smart board
30.	4/12/23 (5)	Cycles and Races- Reduction of state Race free state assignment.	Lecture	black board
31.	9/12/23 (1)	Hazard free circuit design.	Lecture	black board
32.	10/12/23 (7)	Introduction of Hardware	Lecture	black board
33.	11/12/23 (4)	Description language - combinational	Video	Smart board
34.	12/12/23 (3)	circuits - Half Adder, Full adder	Lecture	black board
35.	12/12/23 (8)	Multiplexer, De-multiplexer, counters	Video	Smart board
36.	12/12/23 5	coding combinational/sequential circuits using HDL.	Lecture	black board


 Signature of HOD

STUDENTS' COUNCELLING RECORD

Students were instructed to be present on time for the classes, with proper notebooks. Also instructions regarding the assignment submission was given.

For

RECORD OF INSPECTION

SL.No.	Date of Inspection		Signature of Staffs		Signature of HOD	
L	14/11/23		Vanshij		For	

For
Signature of Dean

CLASS TIME TABLE

Day	PERIOD						
	1	2	3	4	5	6	7
Monday	22BM3251	←	22BM3001/	22BM3002	22BM3204	SEM	22BM3201
Tuesday	22BM3201	22BM3202	22BM3251	22BM3203	LIB	22MA3151	22BM3251
Wednesday	22MA3151	22BM3202	22BM3204	22BM3202	22BM3251	22BM3203	SEM
Thursday	22BM3204	22BM3203	SEM	22MA3151	22MC3191	← 22BM3251 →	
Friday	22BM3203	22BM3201	22MA3151	SEM	←	22BM3001/	22BM3002
Saturday	22BM3202	22BM3201	22BM3204	22MC3191	← 22MA3151 →		TWM

INDIVIDUAL TIME TABLE

Day	PERIOD						
	1	2	3	4	5	6	7
Monday	22BM3251	21BM5202			←	21BM5001	→
Tuesday		21BM5202	22BM3251				22BM3251
Wednesday		21BM5001	← 21BM5001 →		22BM3251		
Thursday						22BM3251	22BM3251
Friday							21BM5202
Saturday	21BM5202					21BM5202	

RECORD OF INSPECTION

S.No	Date of Inspection	Signature of Faculty	Signature of HOD
1	14/11/23	Vandana	Jr


 Signature of Dean