BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF CIVIL ENGINEERING

Teaching Methods Summary

A.Y 2023-24

I Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	Act	Assign	MT	VL	PL	F	EL	BL
1	23HM1T01	Comm-Eng	✓	✓										✓								✓		✓					
2	23BS1T01	Engg physics	✓	✓													✓	✓					✓	✓					
3	23ES1T01	BEEE	✓	✓							✓							✓		✓									
4	23BS1T02	Linear Algebra& calculs	✓										✓				✓	✓					✓						
5	23ES1T02	CP	✓	✓							✓												✓						

I Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	Act	Assign	MT	VL	PL	F	EL	BL
1	23BS2T03	Chemistry	✓	✓														✓					✓	✓					
2	23BS2T04	Differential eq & vector calculus	✓										✓				✓	✓					✓						
3	23ES2T03	BCME	✓	✓							✓												✓						
	23ES2T04	EG	✓	✓									✓					✓					✓						
4	23CE2T01	EM	✓	✓													✓	✓					✓						

II Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	Act	Assign	MT	VL	PL	F	EL	BL
1	BSC301	Mathematics - III	✓										✓				✓	✓					✓						
2	PCC301	SM-I	✓	✓													✓	✓											
3	PCC302	FM	✓	✓														✓					✓						
4	PCC302	Surveying and Geometrics	✓	✓							✓							✓					✓						
5	PCC303	HE	✓	✓							✓							✓					✓						

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IIYear II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	ACT	Assign	MT	VL	PL	F	EL	BL
1	PC401	CVSM	✓										✓				✓	✓					✓						
2	PC402	SM-II	✓														✓	✓					✓						
3	ES401	HHM	✓														✓	✓					✓						
5	PC403	EE	✓	✓							✓							✓					✓						
6	PC404	MEFA	✓	✓							✓												✓						

III Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	Act	Assign	MT	VL	PL	F	EL	BL
1	PC501	SA	✓														✓	✓					✓						
2	PC502	DDRCS	✓	✓										✓				✓					✓						
3	PC503	GTE-I	✓	✓														✓					✓						
4	OE501	EM	✓	✓							✓							✓					✓						
5	PE501	CTM	✓	✓							✓							✓					✓						

III Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEM	CL	CS	PS	NV	EBI	A	DIF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	PC601	DDSS	✓	✓							✓							✓					✓					✓	
2	PC602	WRE	✓	✓							✓							✓					✓						
3	PC603	GTE-II	✓	✓							✓							✓					✓						
4	PE601	Traffic Engg	✓					✓			✓							✓					✓						
5	OE601	RS&GIS	✓	✓							✓							✓					✓						

IV Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	ACT	Assign	MT	VL	PL	F	EL	BL
1	PE701	UTP	✓	✓				✓			✓							✓					✓						
2	PE702	DMM	✓	✓							✓												✓						✓
3	PE703	UH	✓	✓							✓							✓					✓					✓	
4	OE701	OM	✓	✓				✓			✓		✓																
5	OE702	AM	✓	✓				✓			✓		✓																

T1. White Board With Marker & Talk (WMT)
T2. Power point Presentation (PPT)
T3. Visualization (VI)
T4. Jigsaw (JI)
T5. Tutoring (T)
T6. Discussion (D)
T7. Brain Storming (BS)
T8. Buzz Group (BG)
T9. Seminar (SEM)
T10. Debate (DT)
T11. Quiz (Q)
T12. Demonstration (DEMO)
T13. Cooperative Learning (CL)
T14. Case Study (CS)
T15. Problem Solving (PS)
T16. NPTEL Video (NV)
T17. Enquiry Based Instructions (EBI)
T18 Animation (A)
T19.Differentiation(DIFF)
T20. Activity(ACT)
T21. Assignment(ASIGN)
T22.Mock Test(MT)
T23. Virtual Labs (VL)
T24 Participative learning(PL)
T25.Flipped(F)
T26.Experiential learning(EL)
T27.Blended learning(BL)

P. Svanadh
Coordinator

HEAD OF THE DEPARTMENT
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BONAM VENKATA CHALAMAYYA INSTITUTE OFTECHNOLOGY AND SCIENCE

DEPARTMENT OF CIVIL ENGINEERING

TEACHING METHODS

SUB: HYDRAULICS AND HYDRAULIC MACHINES ES-401 II B.TECH IISEM

AY: 2023-24

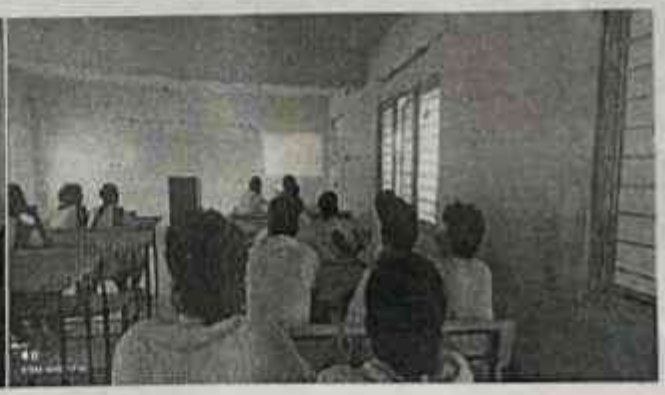
TEACHING METHODS:

1. T1 – White board with marker
2. T15 – Problem solving
3. T16- Nptel video lectures
4. T21- Assignment

T16- Nptel video lectures

https://www.youtube.com/watch?v=K8C3BSB5XPE&t=1s

IMPACT OF JETS



CENTRIFUGAL PUMPS

Fculty signatture

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T21- ASSIGNMENT QUESTIONS

1. Obtain an expression for the depth after the hydraulic jump and the loss of head Due to the jump. Writethe assumptions made
2. Determine the economical cross-section for an open channel of trapezoidal section with side slopes of 1vertical to 2 horizontal, to carry 10 m3/s, the bed slope being 1/2000. Assume Manning coefficient as 0.022.
3. Derive an expression for the discharge through a channel by chezy's formula.
4. Find the most economical cross section of a rectangular channel to carry $0.5m^3$/sec ofWater when channelslope is 1 in 1000. Take C=50.
5. Determine the economical cross-section for an open channel of trapezoidalsection with side slopes of1 vertical to 2 horizontal, to carry 10 m3/s, the bedslope being 1/2000. Assume Manning coefficient as 0.022
6. Derive expression for kinetic energy correction factor
7. A trapezoidal channel discharging water at the rate of 150 m3/sec is to be designed for minimum crosssectional area. Find the bottom width of the channel and depthof water. The side slope is 45^0.Take bedslope as 1 in 1000 and C=50.
8. Derive an expression for the discharge through a channel by chezy's formula
9. Find the most economical cross section of a rectangular channel to carry $0.5m^3$/sec of water when channelslope is 1 in 1000. Take C=50.
10. A circular channel of 2m diameter laid down with 5o inclination to the horizontal ground. Find out thedischarge through the pipe when the depth of water in the pipe is 80 cm. Take C=60.
11. What are the fundamental differences between flow through pipe and flow through open channel?
12. Derive the conditions for most economical section of a rectangular channel.
13. A base width of a trapezoidal channel section is 5 m and side slopes are 1:2. The depth of water is 2.5m. Find the discharge through the channel using chezy'sconstant=50. The bed slope of the channel 1 in 1000.
14. Give complete classification of the different types of open channel flow.
15. Derive the condition for most economical section for a trapezoidal channel.
16. A trapezoidal channel has side slopes of 1 horizontal to 2 vertical and the slope of thebed is 1 in 1500. The area of the section is $40m^2$. Find the dimensions of the section if it is most economical. Also find thedischarge of most economical section if c=50.
17. A rectangular channel carries water at the rate of 400*litress* when bed slope is 1 in2000.Find the mosteconomical dimensions of the channel if c=50.
18. Explain specific energy curve in detail with figure.
19. Find the bed slope of trapezoidal channel of bed width 7m, depth of water 4mand side slope of 3 horizontal to 4 vertical, when the discharge through thechannel is 40 m^3/s. Take Chezy's Constant, C= 65.
20. Illustrate the differences between flow through pipes and flow through channels
21. Prove that for a channel of circular section the depth of flow d = 0.95 D for maximumdischarge where d =depth of flow and D = diameter of circular channel
22. Derive the condition for a most economical rectangular channel

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* Some important point in propeller (Kaplan turbine):

1. The peripheral velocity at inlet & outlet are equal

$$\therefore \boxed{u_1 = u_2 = \frac{\pi D_o N}{60}} \quad (3)$$

D_o = Outer dia of runner

2. Velocity of flow at inlet & outlet are equal

$$\therefore \boxed{V_{f1} = V_{f2}}$$

3. Area of flow at inlet = Area of flow at outlet

$$\therefore \boxed{A = \frac{\pi}{4}(D_o^2 - D_b^2)}$$

1) A Kaplan turbine 24647 kW power at an avg head of 39m Assuming speed ratio of 2. flow ratio = 0.6, diameter of the boss equal to 0.35 times the diameter of the runner and an overall efficiency of 90%. Calculate the diameter, speed and specific speed of the turbine.

Given:-

Shaft power (S.P) = 24647.6 kW

Head (H) = 39m

Speed ratio C_u = 2.0

$$u_1 = C_u \sqrt{2gH}$$

$$u_1 = 2\sqrt{2 \times 9.81 \times 39}$$

$$\therefore \boxed{u_1 = 55.32 \text{ m/s}}$$

∴ flow ratio $\frac{V_{f1}}{\sqrt{2gH}} = 0.6$ (4)

$V_{f1} = 0.6\sqrt{2\times9.81\times39}$

$\boxed{V_{f1} = 16.59 \text{ m/s}}$

Diameter of boss = 0.35 × Diameter of runner.

$\therefore D_b = 0.35 \times D_o$

Overall efficiency (η_o) = 90% = 0.90

$$\eta_o = \frac{S.P}{W.P.}$$

$$W.P = \frac{\rho g Q H}{1000}$$

$$0.90 = \frac{24647.6}{\frac{\rho \times g \times Q \times H}{1000}}$$

$$0.90 = \frac{24647.6}{1000\times9.81\times Q\times39}$$

$$Q = \frac{24647.6}{1000\times9.81\times39\times0.90}$$

$\therefore \boxed{Q = 71.58 \text{ m}^3/\text{sec}}$

$$Q = \frac{\pi}{4}(D_o^2 - D_b^2) \times V_{f1}$$

$$71.58 = \frac{\pi}{4}[D_o^2 - (0.35D_o)^2] \times 16.59$$

$$= \frac{\pi}{4}[D_o^2 - 0.1225D_o^2] \times 16.59$$

$$= \frac{\pi}{4} \times 0.8775D_o^2 \times 16.59.$$

$$D_o = \sqrt{\frac{71.58}{11.433}}$$

$$\boxed{D_o = 2.5\text{m}}$$

$$\therefore D_b = 0.35 \times D_o$$

$$= 0.35 \times 2.5$$

$$\boxed{D_b = 0.875\text{m}}$$

ii) Speed of the turbine $u_1 = \frac{\pi D_1 N}{60}$

$$55.32 = \frac{\pi \times 2.5 \times N}{60}$$

$$N = \frac{60 \times 55.32}{\pi \times 2.5}$$

$$\boxed{N = 422.61 \text{ r.p.m}}$$

iii) Specific speed $N_s = \frac{N\sqrt{P}}{H^{5/4}}$

$$N_s = \frac{422.61 \times \sqrt{24647.6}}{(39)^{5/4}}$$

$$= \frac{422.621 \times 156.99}{97.461}$$

$$\boxed{N_s = 680.76 \text{ r.p.m}}$$

2. A Kaplan turbine runner is to be designed to develop 7357.5 kW shaft power. The net available head is 5.50m Assume that the speed ratio is 2.09 and flow ratio is 0.68, and the overall efficiency is 60%. The diameter of the boss is $\frac{1}{3}$rd of the diameter of the runner. Find the diameter of the runner, its speed & its specific speed?

Sol Given: (6)

Shaft power (P) = 7357.5 kW

Head (H) = 5.50m

Speed ratio (C_u) = 2.09

$$u_1 = C_u\sqrt{2gh} = 2.09 \times \sqrt{2\times 9.81 \times 5.50}$$

$$\boxed{u_1 = 21.71 \text{ m/s}}$$

Flow ratio $\frac{V_{f1}}{\sqrt{2gH}} = 0.68$

$$V_{f1} = 0.68\sqrt{2\times 9.81\times 5.50}$$

$$\boxed{V_{f1} = 7.064 \text{ m/s}}$$

Overall efficiency (η_o) = 60% = 0.60

Diameter of Boss $D_b = \frac{1}{3} \times D_o$

$$\eta_o = \frac{S.P}{W.P}$$

$$W.P = \frac{\rho g Q H}{1000}$$

$$0.60 = \frac{7357.5 \times 1000}{1000 \times 9.81 \times Q \times 5.5}$$

$$Q = \frac{7357.5}{9.81 \times 5.5 \times 0.60}$$

$$\therefore \boxed{Q = 227.27 \text{ m}^3/\text{s}}$$

$$Q = \frac{\pi}{4}(D_o^2 - D_b^2) \times V_1$$

$$227.27 = \frac{\pi}{4}\left[D_o^2 - \left(\frac{D_o}{3}\right)^2\right] \times 7.064$$

$$= \frac{\pi}{4}\left[D_o^2 - \frac{D_o^2}{9}\right] \times 7.064$$

$$= \frac{\pi}{4}\left[\frac{9D_o^2 - D_o^2}{9}\right] \times 7.064 \qquad \left[\because D_b = \frac{D_o}{3}\right]$$

$$= \frac{\pi}{4} \times \frac{8}{9} D_o^2 \times 7.064$$

$$227.27 = 4.9316\, D_o^2$$

$$D_o = \sqrt{\frac{227.27}{4.9316}}$$

$$\boxed{D_o = 6.788 \text{m}}$$

& $D_b = \frac{1}{3} \times D_o$.

$$= \frac{1}{3} \times 6.788$$

$$\boxed{D_b = 2.262 \text{m}}$$

$$u_1 = \frac{\pi D_o N}{60}$$

$$N = \frac{60 \times u_1}{\pi D_o} \quad (8)$$

$$= \frac{60 \times 21.71}{\pi \times 6.788}$$

$$\boxed{N = 61.08 \text{ r.p.m}}$$

$$\text{Specific Speed } (N_s) = \frac{N\sqrt{P}}{H^{5/4}}$$

$$= \frac{61.08 \times \sqrt{73575}}{5.50^{5/4}}$$

$$\boxed{N_s = 622 \text{ rpm}}$$

* Draft tube :—

1. The draft tube is a pipe of gradually increasing area, which connects the outlet of the runner to the tail race.
2. It is used for discharging water from the exit of the turbine to the tail race.
3. One end of the draft tube is connected to the outlet of the runner while the other end is submerged below the level of water in the tail race.
4. The draft tube is mainly used for flowing 2 purposes.

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Teaching Methods Summary

A.Y: 2023-24

I Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C111	Communicative English	√	√														√				√	√						
2	C112	Engineering Physics	√	√													√	√					√	√				√	
3	C113	Linear Algebra and Calculus	√	√				√			√						√	√					√						
4	C114	Basic Electrical & Electronics Engineering	√	√													√						√						
5	C115	Introduction To Programming	√	√														√					√					√	

I Year II Semester

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1	C121	Chemistry	√																				√						
2	C122	Differential Equations & Vector Calculus	√	√				√			√						√	√					√						
3	C123	Basic Civil & Mechanical Engineering	√	√							√												√						
4	C124	Engineering Graphics	√																										
5	C125	Electrical Circuit Analysis-I	√	√					√		√	√	√				√	√					√					√	

II Year I Semester

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1	C211	Mathematics- IV	√	√				√			√						√	√					√						
2	C212	Electronic Devices and Circuits	√	√	√															√			√	√				√	
3	C213	Electrical Circuit Analysis –II	√	√							√							√					√					√	
4	C214	DC Machines and Transformers	√																							√	√	√	
5	C215	Electro Magnetic Fields	√	√													√	√					√	√					
6	C2110	Professional Ethics & Human Values	√																										

II Year II Semester

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1	C221	Python Programming	√	√																			√					√	
2	C222	Digital Electronics	√	√							√							√					√				√	√	
3	C223	Power System-I	√	√							√							√					√			√			√
4	C224	Induction and Synchronous Machines	√	√													√			√			√			√		√	
5	C225	Managerial Economics & Financial Analysis	√	√																									

III Year I Semester

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1	C311	Power Systems-II	√	√	√						√						√						√			√			
2	C312	Power Electronics	√	√							√							√					√					√	
3	C313	Control Systems	√	√																			√					√	
4	C314	Open Elective- I Signals & Systems	√	√			√				√						√	√					√						
5	C315	Professional Elective - I Utilization of Electrical Energy	√	√														√		√			√					√	
6	C318	Soft Skill Course Employability Skills	√																										
7	C319	Environmental Science	√																										

III Year II Semester

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1	C321	Microprocessors and Microcontrollers	√	√			√				√							√					√					√	
2	C322	Electrical Measurements and Instrumentation	√	√							√							√					√			√		√	
3	C323	Power System Analysis	√	√							√												√					√	
4	C324	Professional Elective - II Switchgear and Protection	√	√							√						√	√		√			√			√	√		
5	C325	Open Elective -II Basic Electronics	√	√							√							√					√						
6	C3210	Research Methodology	√	√							√							√					√						

IV Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C411	Professional Elective – III : Renewable and Distributed Energy Technologies	√	√							√							√					√				√	√	
2	C412	Professional Elective – IV : High Voltage Engineering	√	√							√																		
3	C413	Professional Elective – V : Power System Operation and Control	√	√			√							√	√			√										√	√
4	C414	Open Elective- III : Concept of Internet of Things	√	√							√																		
5	C415	Open Elective- IV : IC Applications	√	√							√												√						

T1. White Board With Marker & Talk (WMT)
T2. Power point Presentation (PPT)
T3. Visualization (VI)
T4. Jigsaw (JI)
T5. Tutoring (T)
T6. Discussion (D)
T7. Brain Storming (BS)
T8. Buzz Group (BG)
T9. Seminar (SEM)
T10. Debate (DT)
T11. Quiz (Q)
T12. Demonstration (DEMO)
T13. Cooperative Learning (CL)
T14. Case Study (CS)
T15. Problem Solving (PS)
T16. NPTEL Video (NV)
T17. Enquiry Based Instructions (EBI)
T18 Animation (A)
T19.Differentiation(DIFF)
T20. Activity(ACT)
T21. Assignment(ASIGN)
T22.Mock Test(MT)
T23. Virtual Labs (VL)
T24. Participative learning(PL)
T25.Flipped(F)
T26.Experiential learning(EL)
T27.Blended learning(BL)

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

ELECTRIC HEATING & WELDING

PREPARED BY

CHALADI SIVA GANGA BHAVANI Asst.Prof

Introduction

- Electric heating is used for industrial as well as domestic applications. Some of them are as follows:
- **Domestic applications:**

1. Electric irons
2. Electric kettles
3. Electric ovens
4. toasters
5. Hot plates for cooking
6. Water heaters
7. Room heaters

- **Industrial applications:**

1. Heat treatment of insulators
2. Copper wires enamelling
3. For heat treatment of metals
4. To melt various metals
5. Glass moulding

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- **Advantages of electric heating:**

1. Electrical heating processes are clean due to absence of smokes, ash, dust etc.
2. As fuel gases are absent in the heating processes, there is no risk of any pollution.
3. Electrical heating equipment is more safe as electrical tripping devices act reliably and instantaneously upon abnormal conditions.
4. Electrical heaters usually require very little attention and maintenance.
5. Very high temperatures can be obtained.
6. Time required to attain these temperatures is less.
7. Fuel need not be stored.
8. Energy spent can be metered and measured.

Ch.S.A. Blow

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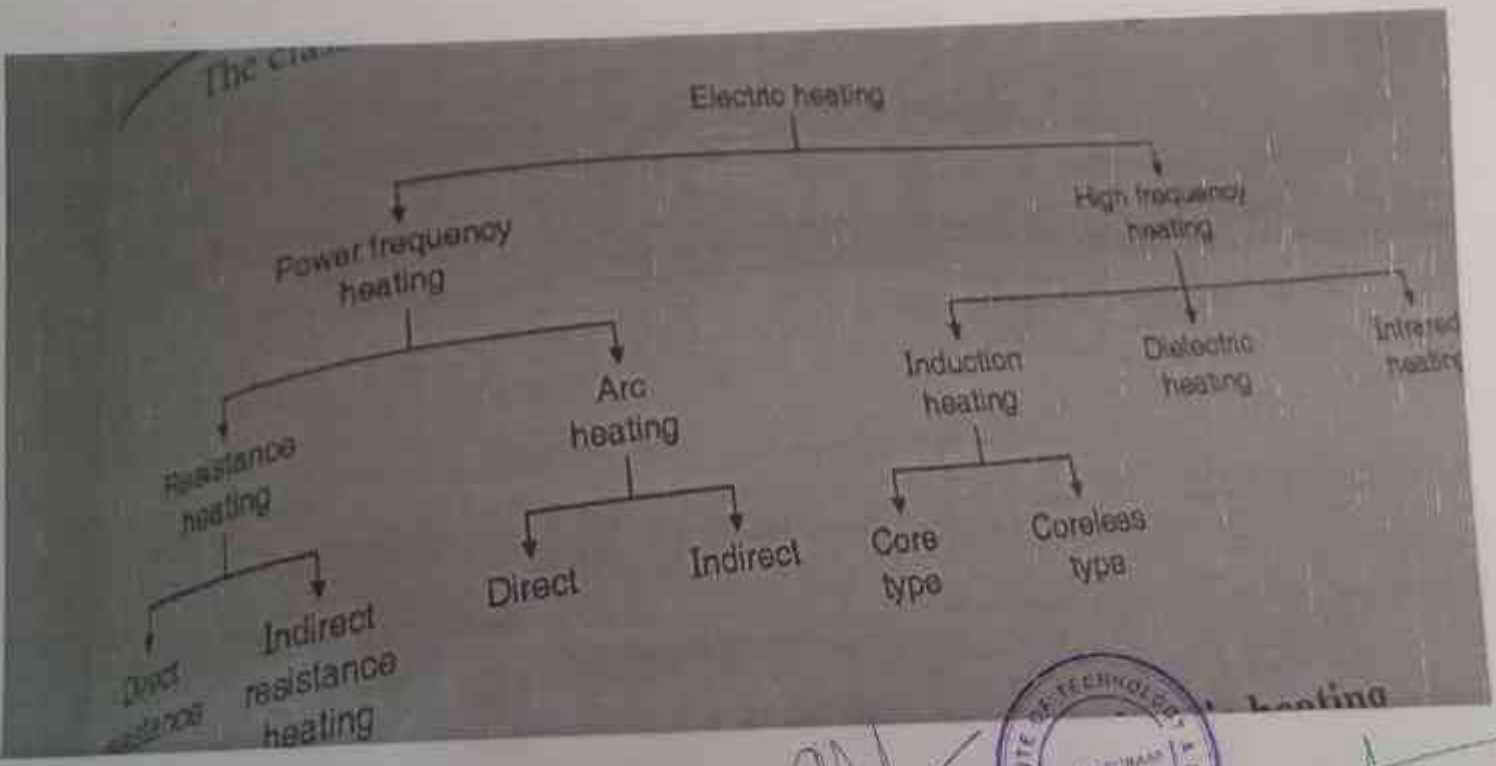
Types of Electrical Heating

- The classification of electric heating:



Resistance Heating

- In this method, when a resistance R carries a current I for t seconds, I2Rt is the heat produced.
- This heat is used for heating purpose.
- There are two types of resistance heating, direct and indirect heating.

1. Direct resistance heating:

- Usually, the body to be heated is called a charge. In this process, the electric current is passed through the charge itself.
- As the heat is developed in the charge itself, this becomes a very efficient process of heating. ex. Water heater

Ch.S.C.Block

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2. Indirect resistance heating:

- In this method, heat is transferred to the charge by conduction, convection or radiation.
- Applications:

1. Water geyser
2. Cooking oven
3. Furnaces
4. Room heaters
5. Heat treatment of metals
6. Pottery work

Ch.S.C.Block

Induction heating

- According to Faraday's law, when a magnetic flux links with a conducting body, EMF is induced in the body and thus current flows in it.
- This principle is used for the purpose of heating bodies which have sufficiently low resistivity.
- Square of the current induced multiplied by body resistance is the power utilized in heating the body.
- Therefore, this type of heating can be used for the bodies which are conducting in nature.

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Eddy Current Heating

- By heating an article by eddy currents, it is placed in-side a high frequency a.c. current-carrying coil. The alternating magnetic field produced by the coil sets up eddy currents in the article which, consequently, gets heated up. Such a coil is known as heater.
- coil or work coil & the material to be heated is known as charge or load.
- Primarily, It is the eddy current loss which is responsible for the production of heat although hysteresis loss also contributes to some extent in the case of non –magnetic material.
- The eddy current loss $We \propto b^2 f^2$.
- Hence, this loss can be controlled by controlling flux density B and the supply frequency f. This loss is greatest on surface of the material but decreases as we go deep inside.

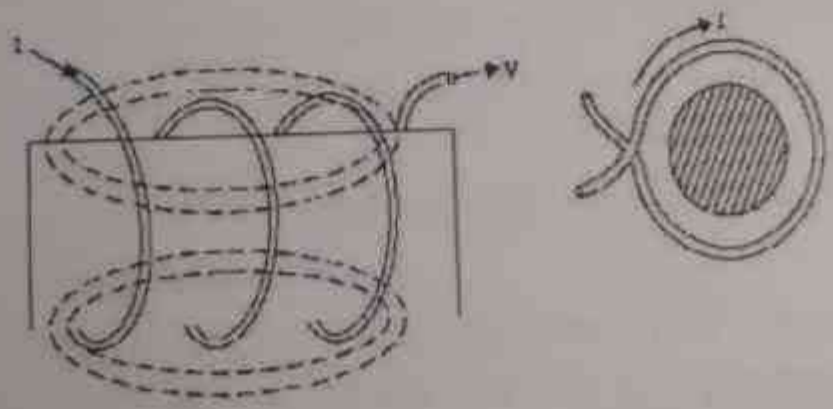

Fig.(1): eddy current flows in the work piece

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- Applications:

1. Surface hardening of metals.
2. Annealing of metals.
3. Brazing.
4. Soldering.
5. Induction cooking.

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Dielectric heating

- In dielectric heating, a high frequency, high ac voltage is applied across a dielectric material.
- The dielectric work piece is held between two metal electrodes. The dielectric material can be plastic, wood etc.
- Due to high voltage RF excitation, some current flows through dielectric material and due to this flow some loss takes place in the dielectric which is called as "dielectric loss."
- This power loss takes place in the form of heat and the dielectric material gets heated up due to it. This is the principle of dielectric heating.

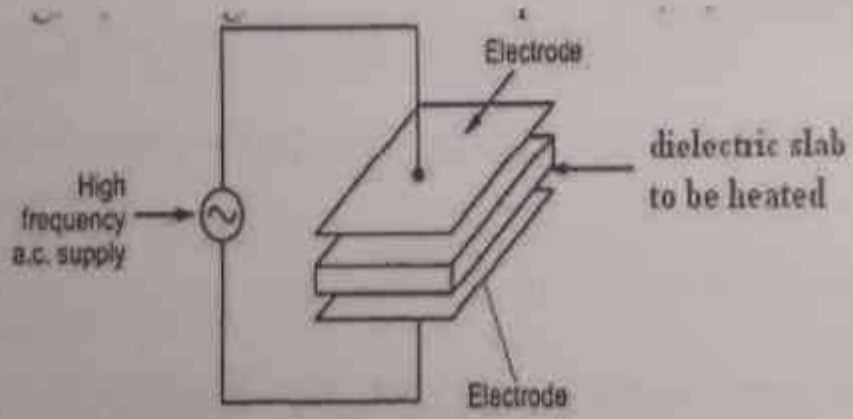

Fig.(1): principle of dielectric heating

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Applications:

Gluing, curing and drying of wood.

Preheating plastic perform of condition them for moulding.

Plastic sewing.

Drying and heat treatment of natural and synthetic rubber, rayon, nylon etc.

Processing of chemicals during manufacture.

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Electric Welding

- Welding is the process of joining two pieces of metal or non metal by applying heat or/and pressure.
- Classification:

 All the welding processes are classified as

1. Fusion welding
2. Non-fusion welding

1. Fusion welding:
   - This type of welding takes place by melting the two metals to be welded together.

   Examples of fusion welding:

i. Gas welding
ii. Electron beam welding
iii. Electrogas welding
iv. Carbon arc welding

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2. Non-fusion welding:

- In this type of welding the metals to be welded together need not be melted. Examples o0f non fusion welding are as follows:

1. Resistance welding
2. Gas non fusion welding
3. Ultrasound welding
4. Friction welding

Arc welding

- The electrodes used for this welding are made up of carbon or graphite.
- An electric arc is struck when the short-ciruited electrodes are separated a little bit.
- In the process of withdrawing the electrodes apart, the area of contact of electrodes first reduces which increases the resistance producing large localized heat and then on actual separation of electrodes, arc is struck.
- Due to high temperature of arc, electrode melts and weld is produced.

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- Classification of arc welding:

1. Metal arc welding
2. Carbon arc welding
3. Atomic hydrogen welding

1. Metal arc welding:
   - In this type, the welding electrode itself is made up of the filler metal.
   - At the time of welding the current flows through the welding electrode, arc, work piece to earth.
   - It is possible to use ac or dc supply.

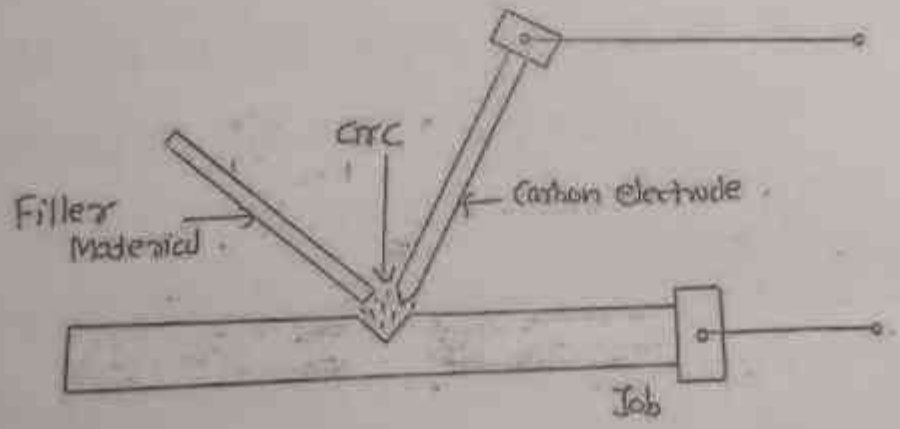

Fig.(1): metal arc welding

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2. Carbon arc welding:

- The electrodes used in this system are of carbon or graphite. The supply voltage should be dc.
- The work piece to be welded is connected to positive end of the supply and the carbon electrode is connected to the negative end.
- Huge current of the order of 800 to 1000 A are drawn from the dc supply at the time of welding.

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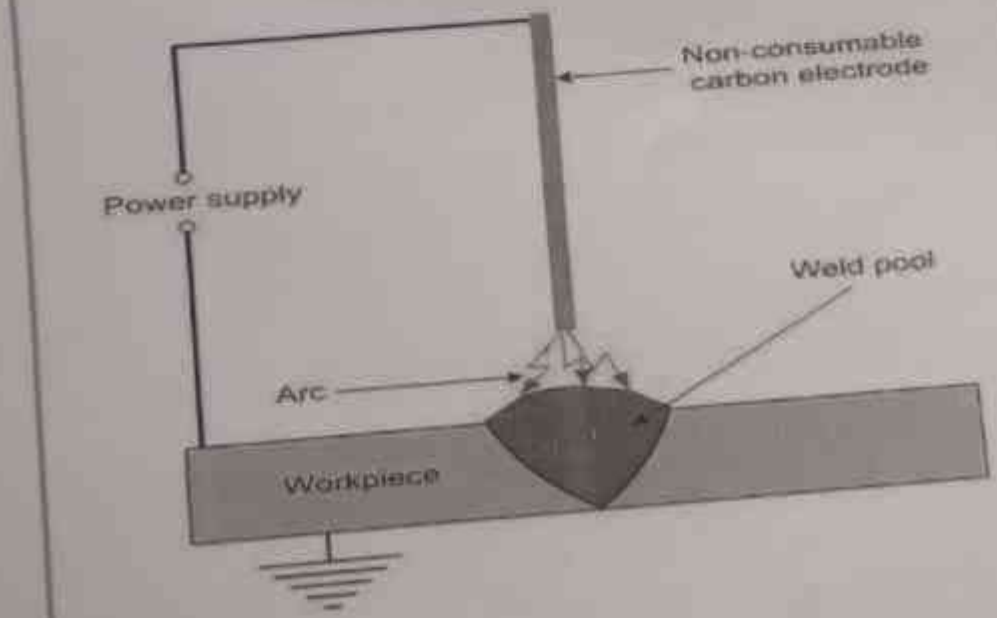

Fig.(2): carbon arc welding

Ch.Sailaja

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3. Atomic hydrogen welding:

- In this method, the tungsten electrodes are kept in the hydrogen atmosphere.
- The arcing takes place between the two tungsten electrodes.
- Hydrogen acts as an agent which atomises and maintains the arc between the electrodes independent of the work pieces to be welded.
- The hydrogen acts in two fold manner, as a cooling agent as well as a protective screen.

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DEPARTMENT OF ELECTRICAL &ELECTRONICS ENGINEERING

List of PPT/Self Learning Materials

Course Name:UEE

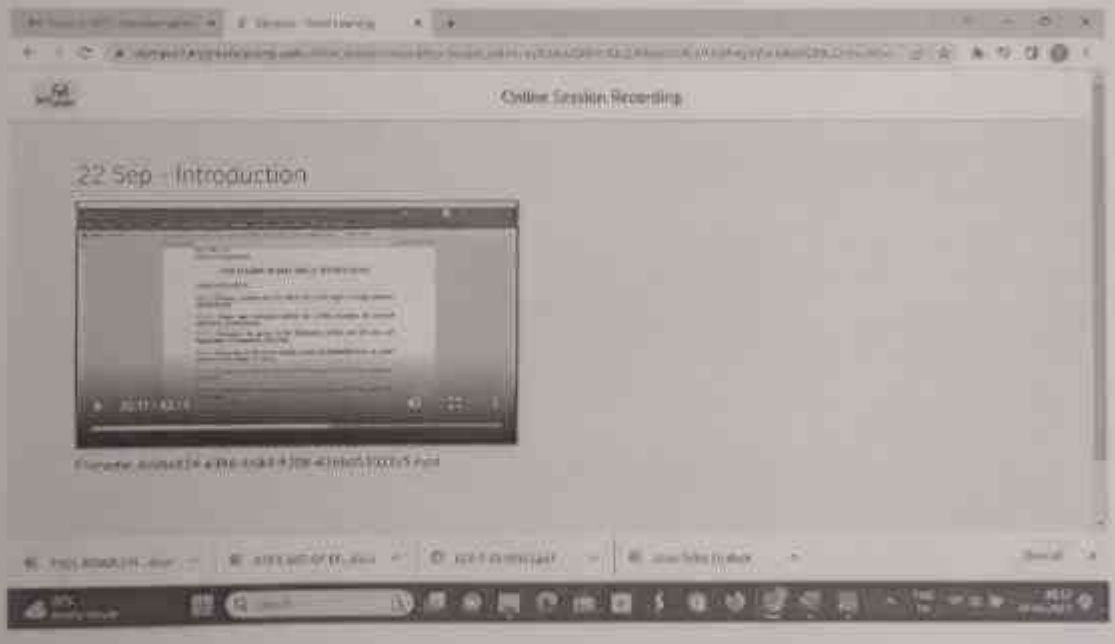
Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name:CH SGANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	INTRODUCTION TO UTILISATION OF ELECTRICAL ENERGY	VIDEO	Great learning https://olympus1.mygreatlearning.com/online_session/recordings?access_token=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJtZW50b3JlZF9zZXNzaW9uX2lkIjo3NTIxND89.J_cuT7zyrXOgLqHAkAYn_k7FzkOrgjsNKDMxuo-Tnvk



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DEPARTMENT OF ELECTRICAL &ELECTRONICS ENGINEERING

List of PPT/Self Learning Materials

Course Name: UEE

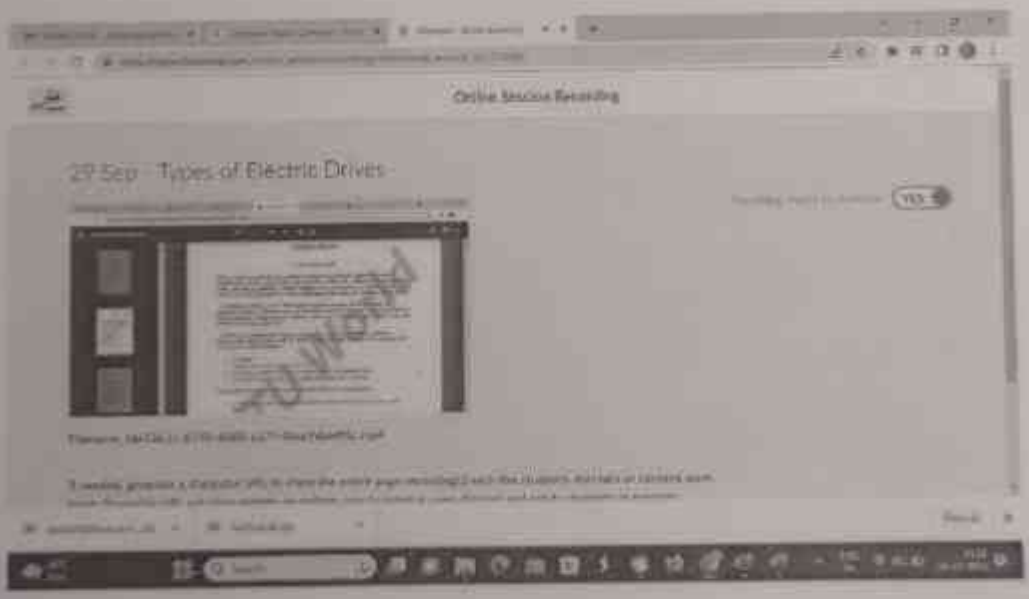
Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	TYPES OF ELECTRICAL DRIVES	VIDEO	Great learning https://olympus1.mygreatlearning.com/online_session/recordings?access_token=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJtZW50b3JlZF9zZXNzaW9uX2lkIjo3NTgyOT29.qpmV4RuGdluGb8PUDb4FmnqQcZCaVyY9pWhfA62Mc0I



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List of PPT/Self Learning Materials

Course Name: UEE

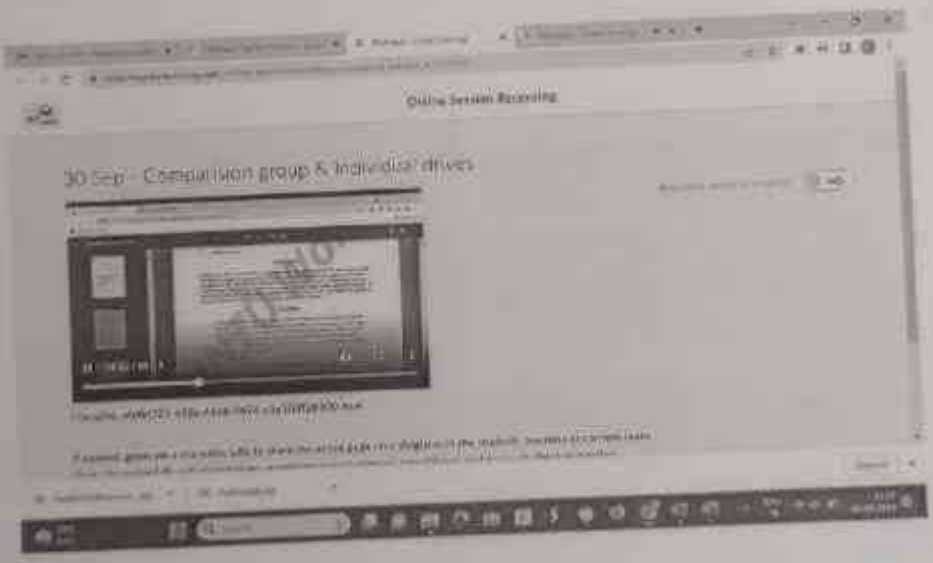
Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	Comparison of group drives & Individual drives	VIDEO	https://olympus1.mygreatlearning.com/online_session/recordings?access_token=eyJ0eXAiOiJKV1QiLCJhbGciOiJIUzI1NiJ9.eyJtZW50b3JIZF9zZXNzaW9uX2lkIjo3NTk1MjF9.6G92yAuYNi1K19jc2Rwft5EEpfoQrwNRzoY2xkWauCg



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List of NPTEL VIDEO

Course Name: UEE

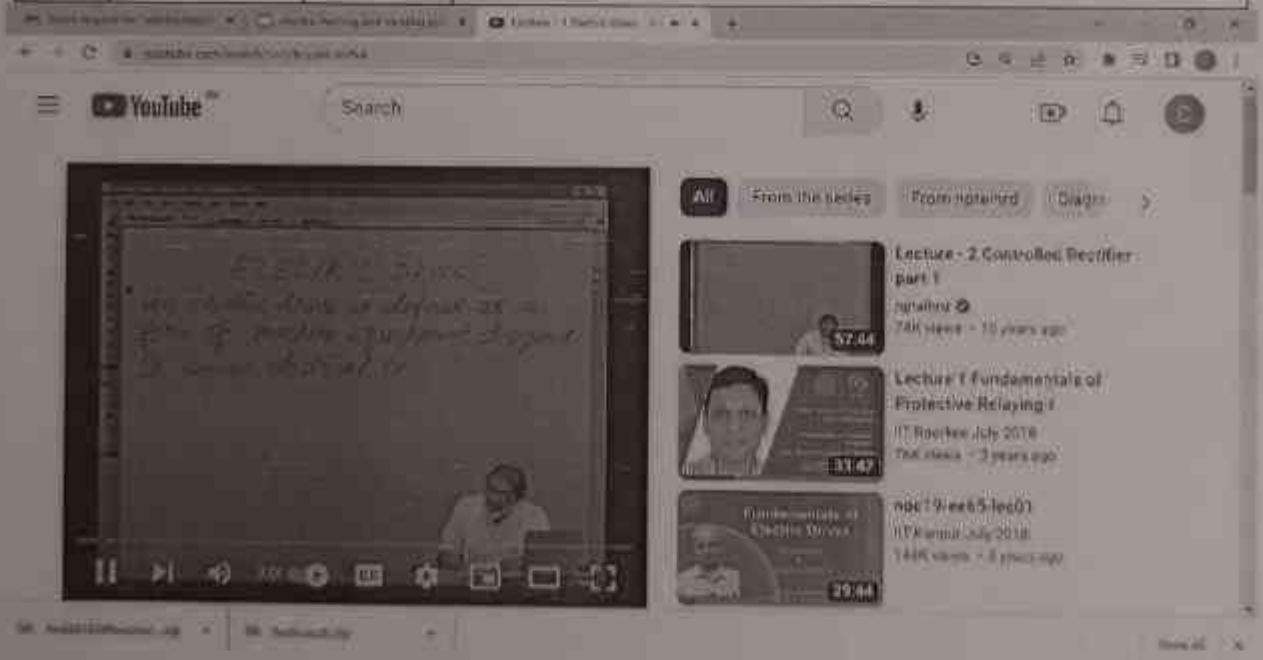
Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	Define Electric drive,Block diagram	NPTEL VIDEO	https://youtu.be/Ub-csHc4VhA



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List of NPTEL VIDEO

Course Name: UEE

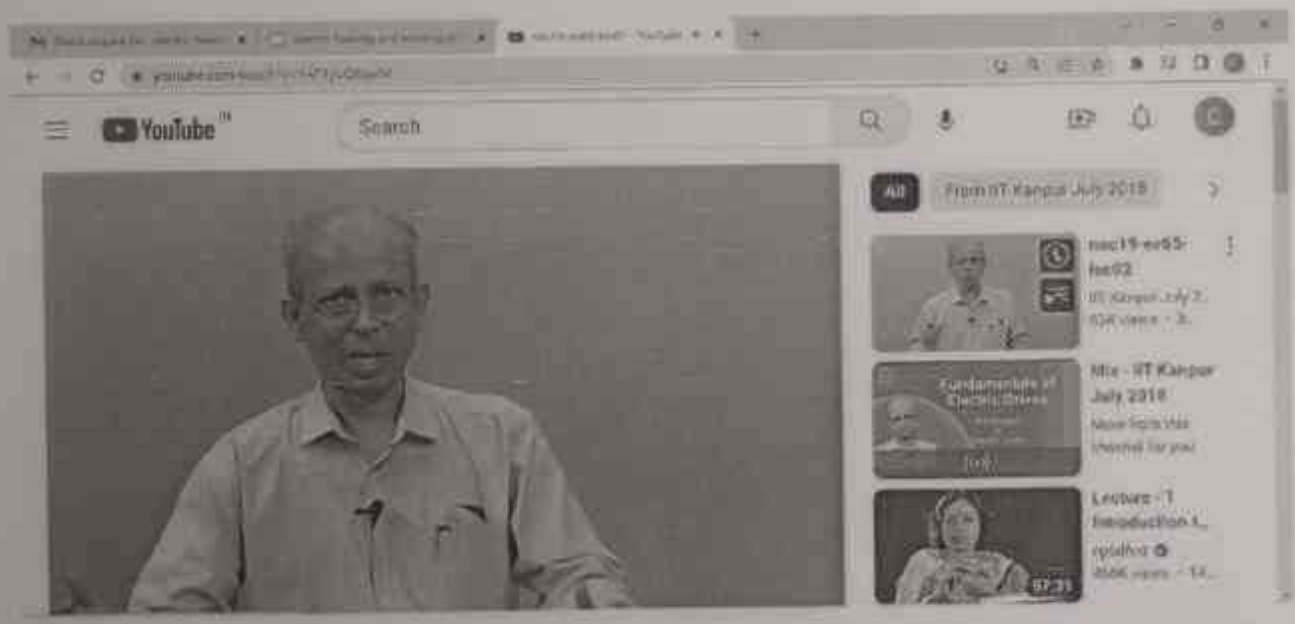
Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	Application of Electric Drives,Factors Governing for Selecting the motor	NPTEL VIDEO	https://youtu.be/1AT1yuQ9awM



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List of ANIMATION VIDEO

Course Name: UEE

Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	Explain Discharge Lamps Operation: MV & SV lamps	ANIMATION VIDEO	https://youtu.be/W3qM1kFaY3w

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List of NPTEL VIDEO

Course Name: UEE

Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	Speed Control Methods of DC & AC Motors	NPTEL VIDEO	https://youtu.be/VoN0e3n6EGA

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List of ANIMATION VIDEO

Course Name: UEE

Year / Sem: III B.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	Explain about Induction Heating: Core Type& Core less Furnace	ANIMATION VIDEO	https://youtu.be/RgFFiRu7sUM

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List of ANIMATION VIDEO

Course Name: UEE

Year / Sem: IIIB.Tech/I Sem

AY: 2023-2024

Faculty Name: CH S GANGA BHAVANI

Course Code: C3152

S.No	Topic	Type of Materials	Source
1	Mechanics of Train movement	ANIMATION VIDEO	https://youtu.be/00fHoJFpAZA

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List of Real Time Examples

Course Name: UEE

AY: 2023-2024

Course Code: C3152

Year / Sem: III B.Tech/I Sem

Faculty Name: CH S GANGA BHAVANI

S.No	Topic	Type of Materials	Source
1	Resistance Heating	Real time Examples	https://www.alamy.com/stock-photo/electric-resistance-heat.html?sortBy=relevant

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DEPARTMENT OF MECHANICAL ENGINEERING

Teaching Methods Summary

A.Y: 2023-2024

IV Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	MT	VL	MT	VL	PL	F	EL	BL
1	C411	UCMP	√	√						√	√		√														√		
2	C412	PPE	√	√						√	√		√							√							√		
3	C413	NDE	√	√						√	√		√														√		
4	C414	AM	√	√									√							√							√		
5	C415	SE	√	√							√		√							√							√		
6	C416	UHM	√	√							√		√							√							√		

T1. White Board With Marker & Talk (WMT)
T2. Power point Presentation (PPT)
T3. Visualization (VI)
T4. Jigsaw (JI)
T5. Tutoring (T)
T6. Discussion (D)
T7. Brain Storming (BS)
T8. Buzz Group (BG)
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T16. NPTEL Video (NV)
T17. Enquiry Based Instructions (EBI)
T18 Animation (A)
T19.Differentiation(DIFF)
T20. Activity(ACT)
T21. Assignment(ASIGN)
T22.Mock Test(MT)
T23. Virtual Labs (VL)
T24 Participative learning(PL)
T25.Flipped(F)
T26.Experiential learning(EL)
T27.Blended learning(BL)

Coordinator

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DEPARTMENT OF MECHANICAL ENGINEERING

FLIPPED

A.Y:2023-2024

Benefits of Non-Destructive Testing

1) **Safety: Finds problems early to prevent accidents.**
2) **Cost savings: Detects issues without damaging materials, reducing repair and replacement costs.**
3) **Quality Assurance: Ensures materials and products meet quality standards.**
4) **Longevity: Helps extend the life of equipment and structures.**
5) **Efficiency: Allows for quick and thorough inspections without halting operations.**

1.What is cot saving?

a.Detect issues without damaging materials, reducing repair and replacement cost.

2.What is quality assurance?

a.Ensure materials and products meet quality standards.

3.what is NDT?

a.Inspecting materials without causing damage can be reused after test.

4.what is NDT fullform?

a.NON DISTRUCTIVE TESTING.

5.Why is NDT Importance?

A.It helps find problems in materials without causingany damage.

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DEPARTMENT OF MECHANICAL ENGINEERING

SEMINAR

A.Y: 2023-2024

1	20H41A0301	ANDROTHU NAGA DURGA JAGADEESH	Span of NDE Activities Railways, Nuclear, Non-nuclear
2	20H41A0302	BUDITHI NANDINI	NDE of pressure vessels
3	20H41A0303	CHELLU LAYA SATYA KISHORE	Radiographic test, Sources of X and Gamma
4	20H41A0305	DONIPATI SURESH	Safety Aspects of Industrial Radiography,
5	20H41A0307	KAMISETTI GOWTHAM	Ultrasonic test
6	20H41A0308	KUMPATLA SAMADHANA RAJU	Principle of Wave Prbpagation, Reflection, Refraction, Diffraction
7	20H41A0309	NAVEED ABBAS MUNNU	Sound Field, Piezo-electric Effect,
8	20H41A0310	PAPPULA ADI DURGA RAO	Ultrasonic Transducers and their
9	20H41A0311	PENNADA BHAIRAVA MURTHY	Variables Affecting Ultrasonic Test, Ultrasonic
10	20H41A0312	PENNADA RAJU	Liquid Penetrant Test
11	20H41A0313	YERUBANDI GUNA DURGA VENKATESH	Liquid Penetrant System
12	21H45A0301	ADARI SATISH	Effectiveness, DPI, FPI
13	21H45A0302	ANALA PRASAD	Eddy Current Test
14	21H45A0303	AVALA SURYAPRAKASH	Eddy Current Test System
15	21H45A0304	BALLA VIJAYA MANOHAR	Testing Effectiveness of Eddy Current Testing
16	21H45A0305	BENDI GANESH	Magnetic Particle Test
17	21H45A0306	DIVAKARLA SAI LAKSHMI RAMARAO	Magnetization of Materials
18	21H45A0307	GOKARLA UDAY	Principle of Magnetic Particle Test
19	21H45A0308	GOLLU LOKESH	Magnetic Particle Test Equipment
20	21H45A0309	GUTHULA UDAY BHASKAR	ications and Limitations of the Magnetic Particle
21	21H45A0310	KADIYAM RAJESH	Infrared And Thermal Testing
22	21H45A0311	KASIREDDY SAI SIVA ADARSH	infrared and thermal
23	21H45A0312	KOPPISETTI DEVI NAGA SAIRAM	Lock in and pulse thermography
24	21H45A0313	KOTIPALLI SATYA JOGARAO	phy-Contact and non-contact thermal inspection
25	21H45A0314	MAJJI GANESH	Heat sensitive paints –Heat
26	21H45A0315	MAMIDISETTI SRIRAMANARAYANAREDDY	thermally quenched phosphors liquid crystals
27	21H45A0316	MANEPALLI CHANDRA VENKATA SATISH	–techniques for applying liquid
28	21H45A0317	MANEPALLI CHARAN MEHAR SAI	temperature sensitive coatings
29	21H45A0318	MASAKAPALLI LAKSHMI NARASIMHA	s –Infrared radiation and
30	21H45A0319	MATTAPARTHI VISHNU VARDHAN	detectors–thermo mechanical behaviour of materials–IR
31	21H45A0320	MERLA CHINNA NAGESWARA RAO	imaging in aerospace
32	21H45A0321	PATI SURYA DINESH	Honey comb and sandwich structures–Case
33	21H45A0322	PERABATTULA TEJA LAKSHMI NARAYANA	Radiographic test, Sources of X and Gamma
34	21H45A0323	PETLA DURGA PRASAD	Magnetic Particle Test
35	21H45A0324	PITHANI AKHIL	Variables Affecting Ultrasonic Test, Ultrasonic
36	21H45A0325	POLISETTI SURIBABU	Radiographic test, Sources of X and Gamma
37	21H45A0326	PONNANA GNANESWARA RAO	Safety Aspects of Industrial Radiography,
38	21H45A0327	REDDY RAVITEJA	Ultrasonic test
39	21H45A0328	RELANGI V V S S N DURGA RAVI TEJA	detectors–thermo mechanical behaviour of
40	21H45A0329	SAMINEEDI NAGA SIVA DURGA PRASAD	Span of NDE
41	21H45A0330	SUNKARA RAMA VEERA VENKATA SATYA SAI	Heat sensitive paints –Heat
42	21H45A0331	TAILAM SAMPATHA SATYANARAYANA	Honey comb and sandwich structures–Case
43	21H45A0332	TALLURI LAKSHMI MANIKANTA	imaging in aerospace
44	21H45A0333	VAKADI LAKSHMI VENKATA KUMAR	Eddy Current Test
45	21H45A0334	VANACHARLA ADITYA AVINASH	Sound Field, Piezo-electric Effect,
46	21H45A0335	VANTHALA VIKASH RAJU	Principle of Magnetic Particle Test
47	21H45A0336	VEERA YEJNA NAGA DURGA RAO	NDE of pressure vessels
48	21H45A0337	YEDIDA SRI SAI DURGA VARAPRASAD	Effectiveness, DPI, FPI

49	21H45A0338	YELCHURI JASWANTH KUMAR	Infrared And Thermal Testing
50	21H45A0339	GEDDAM ROHITH	Honey comb and sandwich structures-Case

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1	20H41A0301	ANDROTHU NAGA DURGA JAGADEESH	Ultrasonic test ON NON DISTRUCTIVE TESTING
2	20H41A0302	BUDITHI NANDINI	
3	20H41A0303	CHELLU LAYA SATYA KISHORE	
4	20H41A0305	DONIPATI SURESH	
5	20H41A0307	KAMISETTI GOWTHAM	
6	20H41A0308	KUMPATLA SAMADHANA RAJU	
7	20H41A0309	NAVEED ABBAS MUNNU	
8	20H41A0310	PAPPULA ADI DURGA RAO	
9	20H41A0311	PENNADA BHAIRAVA MURTHY	
10	20H41A0312	PENNADA RAJU	Liquid Penetrant Test
11	20H41A0313	YERUBANDI GUNA DURGA VENKATESH	
12	21H45A0301	ADARI SATISH	
13	21H45A0302	ANALA PRASAD	
14	21H45A0303	AVALA SURYAPRAKASH	
15	21H45A0304	BALLA VIJAYA MANOHAR	Magnetic Particle Test
16	21H45A0305	BENDI GANESH	
17	21H45A0306	DIVAKARLA SAI LAKSHMI RAMARAO	
18	21H45A0307	GOKARLA UDAY	
19	21H45A0308	GOLLU LOKESH	
20	21H45A0309	GUTHULA UDAY BHASKAR	Infrared And Thermal Testing
21	21H45A0310	KADIYAM RAJESH	
22	21H45A0311	KASIREDDY SAI SIVA ADARSH	
23	21H45A0312	KOPPISETTI DEVI NAGA SAIRAM	
24	21H45A0313	KOTIPALLI SATYA JOGARAO	Magnetic Particle Test Equipment
25	21H45A0314	MAJJI GANESH	
26	21H45A0315	MAMIDISETTI SRIRAMANARAYANAREDDY	
27	21H45A0316	MANEPALLI CHANDRA VENKATA SATISH	
28	21H45A0317	MANEPALLI CHARAN MEHAR SAI	thermally quenched phosphors liquid crystals
29	21H45A0318	MASAKAPALLI LAKSHMI NARASIMHA	
30	21H45A0319	MATTAPARTHI VISHNU VARDHAN	
31	21H45A0320	MERLA CHINNA NAGESWARA RAO	
32	21H45A0321	PATI SURYA DINESH	
33	21H45A0322	PERABATTULA TEJA LAKSHMI NARAYANA	
34	21H45A0323	PETLA DURGA PRASAD	Honey comb and sandwich structures
35	21H45A0324	PITHANI AKHIL	
36	21H45A0325	POLISETTI SURIBABU	
37	21H45A0326	PONNANA GNANESWARA RAO	
38	21H45A0327	REDDY RAVITEJA	
39	21H45A0328	RELANGI V V S S N DURGA RAVI TEJA	, Eddy Current Test System
40	21H45A0329	SAMINEEDI NAGA SIVA DURGA PRASAD	
41	21H45A0330	SUNKARA RAMA VEERA VENKATA SATYA SAI	
42	21H45A0331	TAILAM SAMPATHA SATYANARAYANA	
43	21H45A0332	TALLURI LAKSHMI MANIKANTA	
44	21H45A0333	VAKADI LAKSHMI VENKATA KUMAR	temperature sensitive coatings
45	21H45A0334	VANACHARLA ADITYA AVINASH	
46	21H45A0335	VANTHALA VIKASH RAJU	
47	21H45A0336	VEERA YEJNA NAGA DURGA RAO	
48	21H45A0337	YEDIDA SRI SAI DURGA VARAPRASAD	

49	21H45A0338	YELCHURI JASWANTH KUMAR	Sound Field, Piezo-electric Effect
50	21H45A0339	GEDDAM ROHITH	

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BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF MECHANICAL ENGINEERING

ACADEMIC YEAR:2023-2024

POWER POINT PRESENTATION : NON DESTRUCTIVE TESTING

PPT PRESENTED BY

MR.CH.NARESH

ASSISTANT PROFESSOR

MECHANICAL DEPARTMENT

BVCITS

BATLAPALEM

G.Rmf

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DEPARTMENT OF MECHANICAL ENGINEERING

QUIZ

A.Y:2023-2024

1.----------testing technique allows the visualization of heat patterns on an object

a) Thermography

b) Thermal imaging

c) Infrared thermography

d)All of the above

2.The temperature differences observed on the investigated surface during inspection will be monitored by .....camera

a) An infrared

b) Thermal

c) Both a and b

d) None of the above

3.Which of the following is not the characteristics of infrared?

a)It is sometime called as "heat ray"

b) Its wavelength is larger than the visible light

c) It's a kind of electromagnetic wave

d)It cannot travel through vacuum

4.....is the distance between successive crest of a wave, especially in an electromagnetic wave.

a) Speed of light

b) Frequency

c) Wavelength

d) None of the above

5.The relationship between wavelength and frequency for electromagnetic wave is

a) vc/

b) λv=c

c) λε/v

d) All of the above

6.Emissivity is defined as

a) Hobject+Hblackbody

b) Hobject/Hblack body

c) Hblack body/Hobject

d)H black body+ Hobject

7.e = 1 signifies that the body is a

a)Perfect black body

b) Black body

c)Both a and b

d) None of these

8.Which of the following is an advantage of thermography testing

a) The thermography device is risk as it emits radiation

b) This technique is very slow

c) This technique can create a thermal image

d) This technique is not effective

9.Medium wave infrared is

a) 8 - 14mu*m

b) 3 - 6mu*m

c) 2 - 3mu*m

d) 3 - 5mu*m

10.The output from the IR camera is a grey scale image. That image is also known as

a) IR image

b) Thermogram

c) Color image

d)None of the above

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NDT

- Powerful technique for evaluating exiting concrete structures with regard to their strength and durability apart from assessment and control of quality of hardened concrete without or partial damage to the concrete.

- Concrete is not loaded to the failure, therefore, the strength inferred or estimated can not be expected to yield absolute value of strength.

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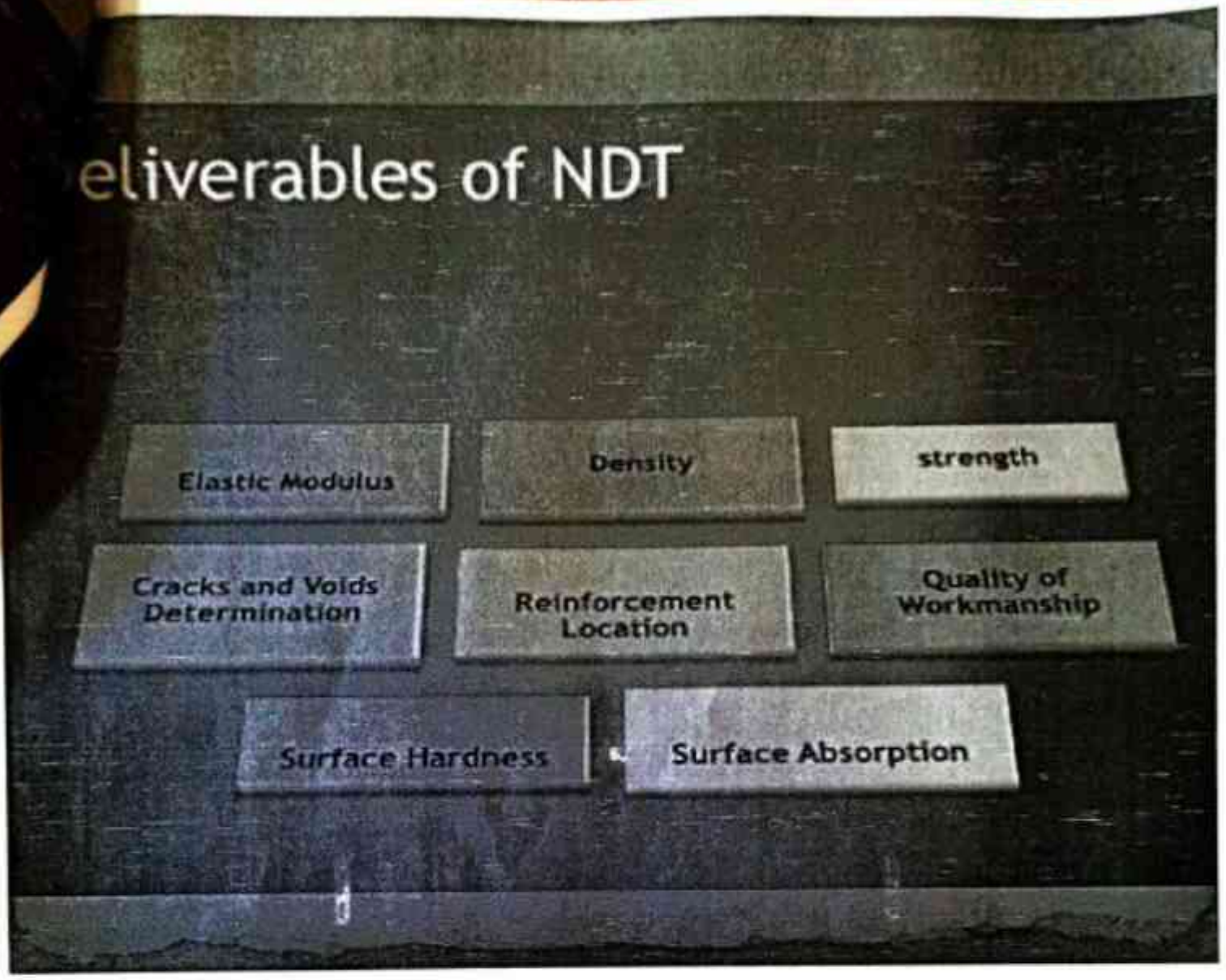
eliverables of NDT
Elastic Modulus
Density
strength
Cracks and Voids Determination
Reinforcement Location
Quality of Workmanship
Surface Hardness
Surface Absorption

REBOUND HAMMER

OBJECTIVES

- To assess quality of the concrete in relation to the standard requirements
- To estimate compressive strength of concrete with the help of suitable correlations between rebound index & compressive strength
- To delineate regions of poor quality or deteriorated concrete in a structure
- To assess quality of one element of the concrete in relation to another

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Teaching Methods Summary

A.Y: 2023-24

I Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C111	Comm-Eng	√	√										√								√		√					
2	C112	Eng-Phy	√	√													√	√					√	√					
3	C113	LA&C	√										√				√	√					√						
4	C114	BEE	√	√							√							√											
5	C115	IOP	√	√									√					√											

I Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C121	Chem	√	√														√					√	√					
2	C122	DE&VC	√										√				√	√					√						
3	C123	BC&ME	√								√							√											
4	C124	EG	√	√	√						√							√											
5	C125	NA	√	√													√	√									√		

II Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C211	E.DC	√	√							√		√					√											
2	C212	STLD	√	√									√					√											
3	C213	S&S	√	√							√		√				√	√											

4	C214	Math-III (Transforms and Vector Calculus)	√									√				√	√													
5	C215	RVSP	√	√												√	√													

II Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C221	ECA	√	√							√		√					√											
2	C222	DICD	√	√				√			√		√					√											
3	C223	AC	√	√							√							√		√									
5	C224	LCS	√	√							√						√	√											
6	C225	MOB	√	√							√								√		√					√			

III Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C311	AICA	√	√							√							√											
2	C312	EMWTL	√	√							√						√	√		√									
3	C313	DC	√	√					√				√					√									√		
4	C314	COA	√	√					√		√		√					√											
5	C315	EMI	√	√				√			√						√	√											

III Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C321	MP &MC	√	√				√										√										√	
2	C322	VLSI Design	√	√				√			√						√	√										√	
3	C323	DSP	√					√			√						√	√											
4	C324	MWE	√	√							√						√	√		√									
5	C325	CN	√	√				√			√		√							√									

IV Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C411	DIP	√	√				√			√							√											

2	C412	RE	√	√							√							√											
3	C413	SC	√	√							√							√											
4	C414	IIT	√	√							√		√					√		√									
5	C415	IML	√	√													√	√							√			√	
6	C416	UHV	√	√							√							√											

T1. White Board With Marker & Talk (WMT)
T2. Power point Presentation (PPT)
T3. Visualization (VI)
T4. Jigsaw (JI)
T5. Tutoring (T)
T6. Discussion (D

T7. Brain Storming (BS)
T8. Buzz Group (BG)
T9. Seminar (SEM)
T10. Debate (DT)
T11. Quiz (Q)
T12. Demonstration (DEMO)

T13. Cooperative Learning (CL)
T14. Case Study (CS)
T15. Problem Solving (PS)
T16. NPTEL Video (NV)
T17. Enquiry Based Instructions (EBI)
T18 Animation (A)

T19.Differentiation(DIFF)
T20. Activity(ACT)
T21. Assignment(ASIGN)
T22.Mock Test(MT)
T23. Virtual Labs (VL)
T24 Participative learning(PL)

T25.Flipped(F)
T26.Experential learning(EL)
T27.Blended learning(BL)

Coordinator

HOD

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BVC INSTITUTE OF TECHNOLOGY AND SCIENCE,AMALAPURAM
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

FinFET Technology

PECHETTI GIRISH
Assistant Professor
BVCITS

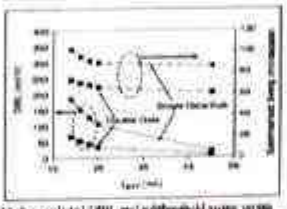
Outline

- Abstract
- Design
- Fabrication
- Performance
- FinFET Layout
- Conclusion

Introduction

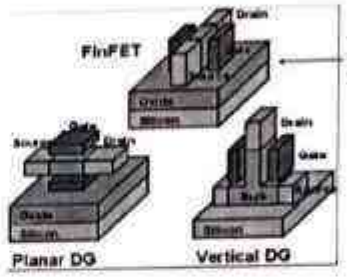
Double-gate FET (DGFET)

->Reduce Short Channel Effects (SCEs)
->Reduce Drain-Induced-Barrier-Lowering
->Improve Subthreshold Swing S



Model-predicted DIBL and subthreshold swing versus effective channel length for DG and bulk-silicon nFETs

Three Types of Double-gate FET



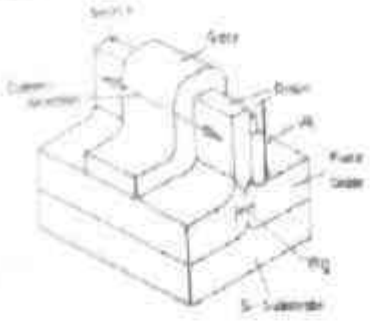
Quasi-CMOS structure
Relatively simple FAB

WHAT IS Finfet?

- Finfet (Fin shaped FET) is a field effect transistor (FET) device structure and method for forming FETs for scaled semiconductor devices
- A method and system is disclosed for providing access to the body of a FinFET device. In one embodiment, a FinFET device for characterization comprises an active fin comprising a source fin, a depletion fin, and a drain fin, a side fin extending from the depletion fin and coupled to a body contact for providing access for device characterization.

- The method facilitates formation of FinFET devices form readily available bulk semiconductor substrates with improved and reproducible fin height control while providing isolation between source and drain regions of the FinFET device
- A finFET device is fabricated using a conventional MOSFET technology The device is fabricated on a silicon layer overlying an insulating layer (SiMOX) with the device extending from insulating layer as a fin
- Double gates are provided over the sides of the channel to provide enhaced drive current and effectively suppressed short channel effects A plurality of channels can be provided for increased current capacity
- In one embodiment we can also use two transistors that can be stacked to a fin to provide cmos process having a shared gate

First FinFET - DELTA (DEpleted Lean-channel TrAnsistor)

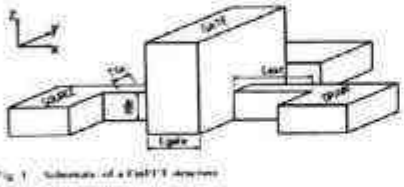


- THE FIRST fabricated fin field-effect transistor (FinFET)-like silicon- on-insulator (SOI) MOS device dates back to 1989, which is known as the fully depleted lean-channel transistor with a silicon film standing vertically
- With the continuous scaling of MOS devices into the 45-nm technology node, nonplanar double-gate (DG) MOSFETs (such as FinFETs) have become attractive for their good control of shortchanneleffects, ideal subthreshold slope, and high current drive.
- However, parasitic resistive or capacitive components become comparable in magnitude to, or even much larger than, intrinsic ones. Large series resistances, which are induced by the narrow-fin nature of nonplanar MOSFETs results in degradation of current drive.

Design - Geometry

$H_{fin} >> T_{fin}$

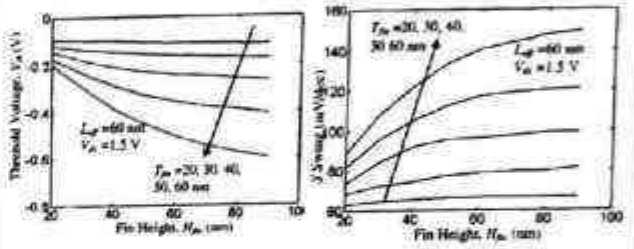
Top gate oxide thickness >> sidewall oxide thickness



Effective channel length $L_{eff} = L_{gate} + 2 \times L_{ext}$

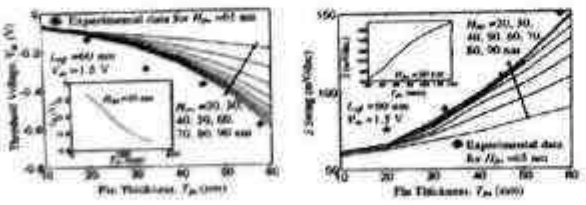
Effective channel width $W = T_{fin} + 2 \times H_{fin}$

Design - Dependence of V_{th} and S Swing on H_{fin}



- The saturation of V_{th} roll-off and S is observed when H_{fin} is increased from 20 nm to 90 nm
- The critical H_{fin} needed for saturation is dependent on T_{fin}
- For larger T_{fin}, the critical H_{fin} is correspondingly larger

Design - Dependence of V_{th} and S Swing on T_{fin}



- V_{th} roll-off and S change more and more rapidly as T_{fin} changing from 10 nm to 60 nm, and slow down after that.
- Fin thickness reduce can suppress short channel effects, but the variation will change the performance of the device a lot

Design - Other Optimization

Nonrectangular Fin

- Hydrogen annealing to round off the corners

Source-Drain Fin-Extension Doping

- Tradeoff regarding SCEs and S/D series resistance

Dielectric Thickness Scaling

Threshold Voltage Control

- Channel doping with symmetric poly-Si gate
- Asymmetric poly-Si gate
- Metal gate

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DEPARTMENT OF DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

GROUP DISCUSSIONS

Course Name: **VLSI DESIGN** Year / Sem: **IIIB.Tech/II Sem**

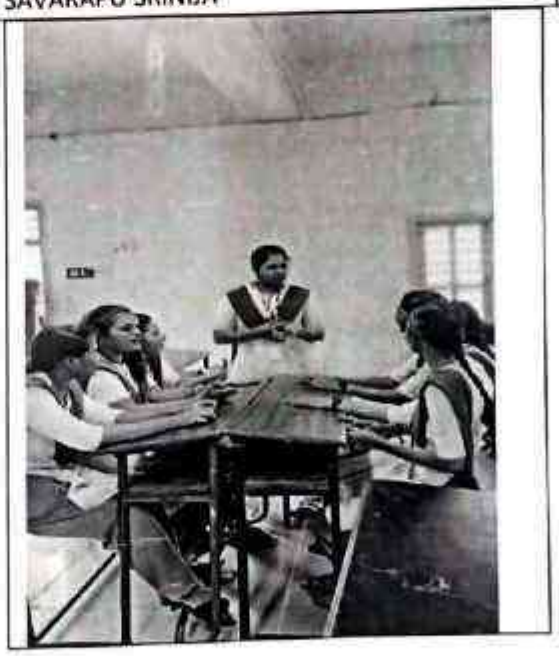
AY: **2023-24** Faculty Name: **P.Girish**

Course Code: **C322**

DISCUSSION

Topic: VLSI TRENDS

S.No.	Reg No	Name	Signature
1	21H41A0473	CHELLUBOYINA USHA PAVANI	Ch. UshaPavani
2	21H41A0476	CHINTHA VASANTHA	Ch. Vasantha
3	21H41A0480	ELLIMILLI MEGHANA	E. Meghana
4	21H41A0486	KAMADI BHAVANI HARIKA	K. Bhavani
5	21H41A0488	KOPPINEDI LAKSHMI PRASANNA	K. Prasanna.
6	21H41A0498	LINGOLU POOJA RAKSHITHA	L. Pooja
7	21H41A04C1	SAVARAPU SRINIJA	S. Srinija



P. Girish.

Faculty signature

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DEPARTMENT OF DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

GROUP DISCUSSIONS

Course Name: **VLSI DESIGN** Year / Sem: **IIIB.Tech/II Sem**

AY: **2023-24** Faculty Name: **P.Girish**

Course Code: **C322**

DISCUSSION

Topic: FABRICATION

S.No.	Reg No	Name	Signature
1	21H41A0467	ACHANTA GEETHA SARANYA	A. Geetha
2	21H41A0472	CHELLUBOINA SANVITHA RATHNAM	CH Sanvitha
3	21H41A0477	CHEGONDI BHAVANA	Ch. Bhavana
4	21H41A0482	GALIDEVARA SRI NEYYA	G. Neyya
5	21H41A04A4	MATTA NAVYASREE	M. Navya
6	21H41A04B4	PEDDIREDDY JYOTHI R SIDDHU LAKSHMANESH	P. Lakshmanesh
7	216M1A04B6	VEGI SINDHU SRI SAI MANI	V. Sindhu

P. Girish
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

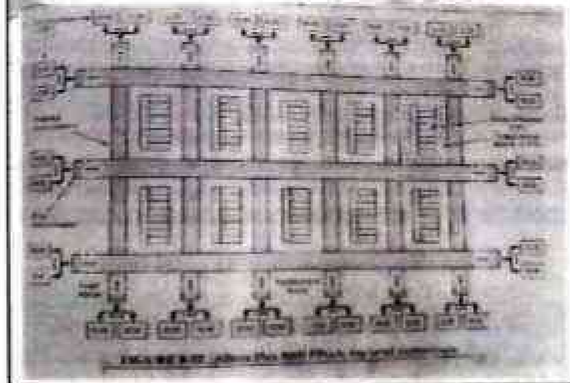
UNIT-V

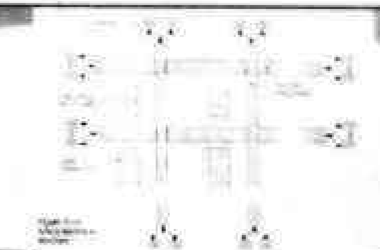
FPGA FAMILIES

- ALTERA FLEX
- XLINXS

21H41A0450
PILLI JNANESWARI

ALTERA FLEX 8000 FPGA





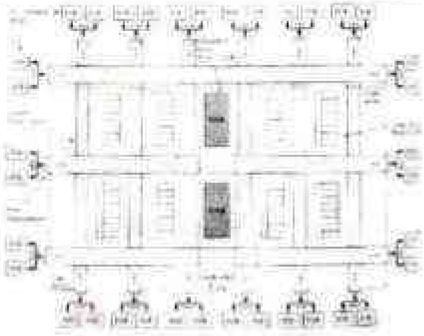
The architecture includes Logic Array Blocks (LAB), Logic Elements (LE) and Input/Output Elements (IOE).

Logic Array Blocks (LABs): These blocks contain eight programmable logic elements that offer a ... LABs arranged in rows and columns are connected to fast track interconnect matrix.

Logic Elements (LEs): These elements consists of 4 input look-up tables (LUT), a program register, dedicated carry and cascade chains. Each logic element has four common signals of which two signals can be used as clocks and the other two can be used for clear/preset control. These signals can be operated through an appropriate input, I/O pin or an internal signal ... LAB.

Input/Output Elements (IOEs): I/O elements contain a bidirectional I/O buffer and a flip-flop register to serve as input or output. These elements are connected to the edges of fast track interconnect.

ALTERA FLEX 10 FPGA



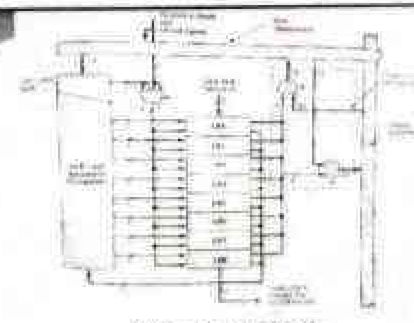
The architecture includes Embedded Array Blocks (EABs), Logic Array Blocks (LABs), Inter connection fabric and I/O Elements (IOE).

Embedded Array Blocks: These blocks contain 2KB of RAM memory. This block can be programmed to implement various configurations such as RAM, ROM, dual port RAM or FIFO.

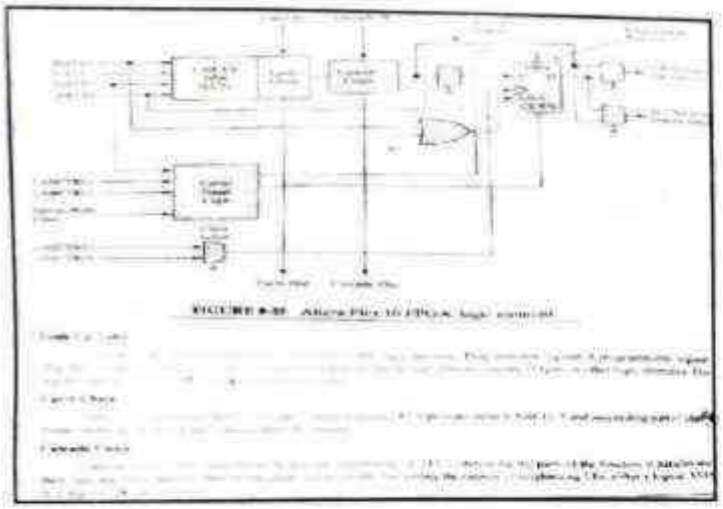
Logic Array Blocks (LABs): These blocks include eight logic elements and a local interconnect.

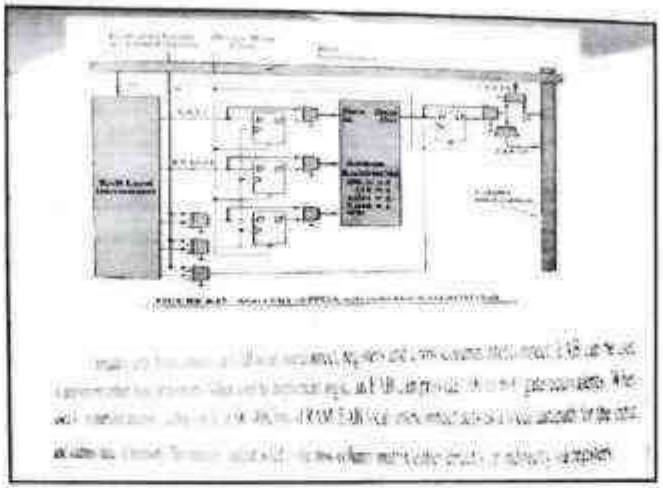
Interconnection fabric: This fabric interconnects logic array and embedded array blocks arranged in rows and columns and offers global interconnect without the use of switch matrix.

I/O Elements: These elements are connected to the edges of interconnect fabric. They can be programmed as input, output or bidirectional signal paths including programmable slew rate control to minimize switching noise.



The architecture includes a local interconnect block, logic element block and ...

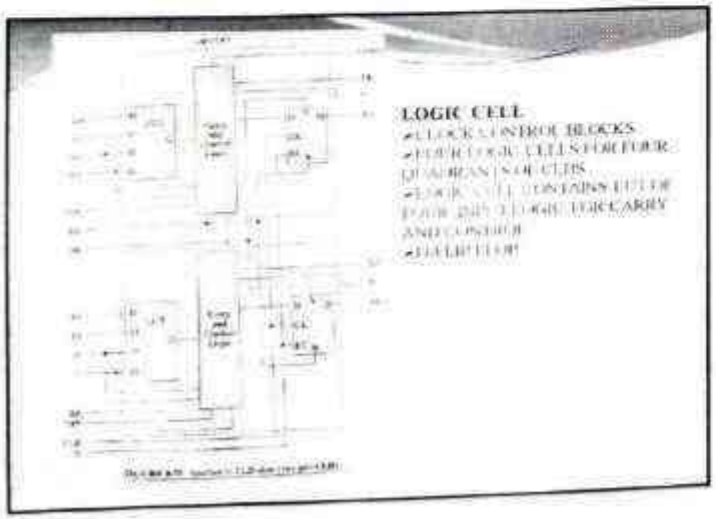




SPARTAN II

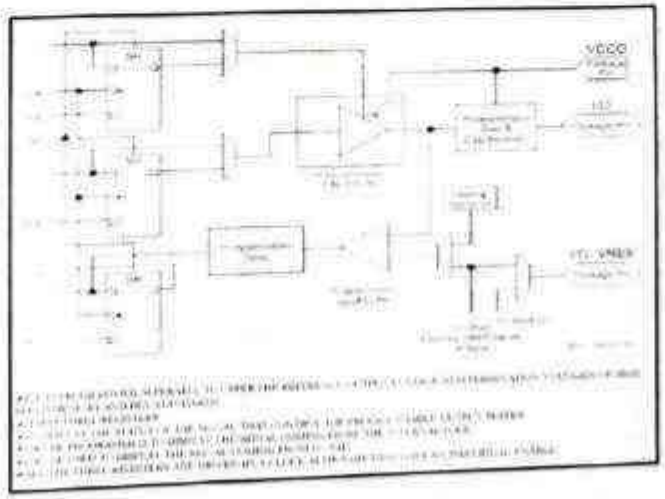
The Spartan II family of Field Programmable Gate Arrays (FPGAs) is implemented with a regular, flexible,

- programmable architecture of Configurable Logic Blocks (CLBs)
- surrounded by a perimeter of programmable Input/output Blocks (IOBs)
- Delay logic loops
- The architecture also provides advanced functions such as Block RAM (4096)



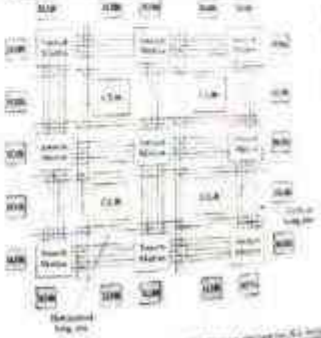
LOGIC CELL

- CLOCK CONTROL BLOCKS
- FOUR LOGIC CELLS FOR FOUR
- LOGIC CELL CONTAINS LUT FOR
- AND CONTROL
- FLIP FLOPS



XLINXS XC 4000 SERIES FPGA

- Xlinxs launched the worlds first commercial FPGA in 1985

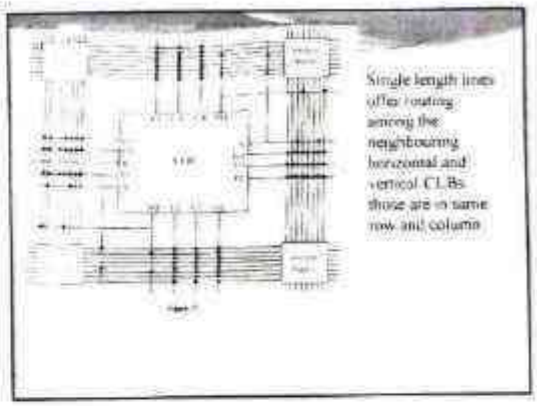


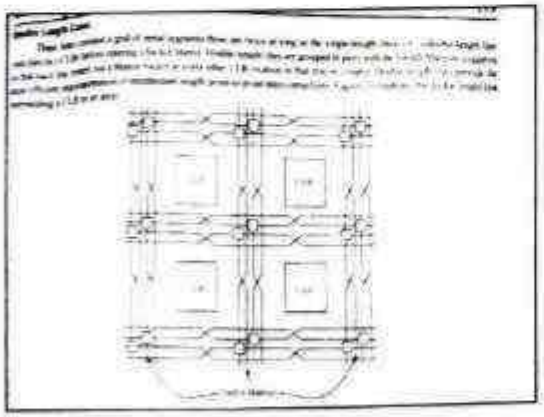
- CLBs
- LOCAL AND GLOBAL INTER ROUTING RESOURCES
- I/O BUFFERS
- SRAM BASED MEMORY

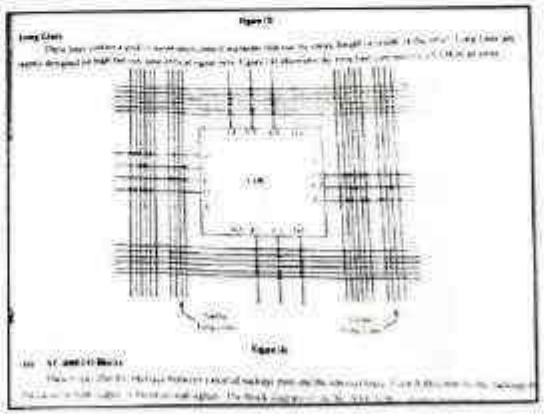
11/14/2021

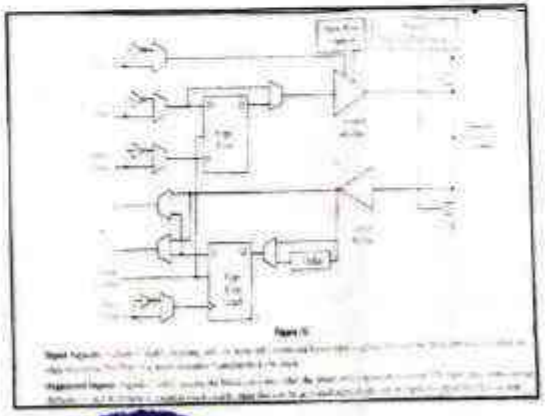
* CLB : Consists three function generators (F,G,H)
* Multiplexers
* Two storage elements
* The function generators are key upon the inputs of CLB which is the key delay.
* One of three function generators can implement any function with four inputs arbitrarily
* Two can implement any boolean function with three inputs
* These two three generators can be programmed to perform

2. Any four unrelated four variables plus any three functions of four unrelated variables and third function upto three unrelated variables
2. Any single function of 5 variables
3. Any function of four variables together with some function of six variable.
4. Some functions of five variable.
* The storage devices can be configured as edge-triggered flip flops with common clock input









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PROBLEM SOLVING

21H91A0415

1. For an n-channel MOSFET circuit $V_{GS} = 0$ $V_{TN} = -2V$ and $K_n = 0.1\ mA/V^2$ Asumme $V_{DD} = 5V$ and $R_S = 5k\Omega$. Determine I_D and V_{DS}.

Sol-Given.

$V_{TN} = -2V$

conduction Parameter, $K_n = 0.1\ mA/V^2$

Input voltage, $V_{DD} = 5V$

Source resistance $R_S = 5K\Omega$.

* I_D & V_{DS} = ?

The drain current I_D is given by.

$$I_D = K_n(V_{GS} - V_{TN})^2$$

$$= 0.1(0-(-2))^2 = 0.4mA.$$

Apply KVL to output loop

$$V_{DD} = V_{DS} + I_D R_S$$

$$V_{DS} = V_{DD} - I_D R_S$$

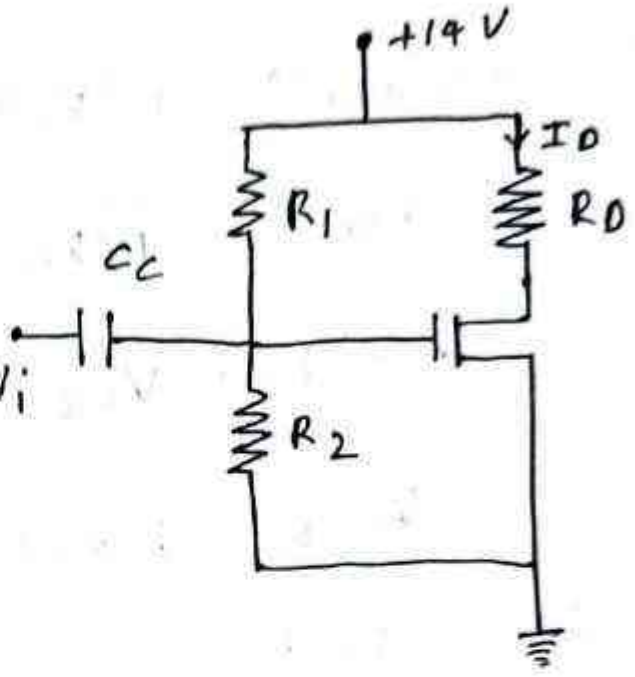
$$= 5 - (0.4 \times 5) = 3V$$

The saturation voltage $V_{DS(sat)}$

$$= V_{GS} - V_{TN} = 0-(-2) = 2V.$$

$\therefore I_D = 0.4mA$, $V_{DS} = 2V$

Design voltage divider bias circuit for NMOS, such that $I_{DQ} = 400\,\mu A$, $V_{DD} = 14\,V$, $V_{DS} = 2.3\,V$ $K_n = 1\,mA/V^2$, $V_t = 1\,V$. Assume a current of 1 mA through R_1 and R_2 and $V_S = 1.2\,V$.



Solution.

$V_{DD} = 14\,V$

$V_{DS} = 2.3\,V$

$I_{DQ} = 400\,\mu A$.

$K_n = 1\,mA/V^2$

$V_t = 1\,V$

$V_S = 1.2\,V$

$$I_{Dt} = K_n (V_{GS} - V_{TN})^2$$

$$= 1\,(V_{GS} - 1)^2$$

$$I_{Dt} = 1\,mA$$

$$1 \times 10^{-6} = 1(V_{GSt} - 1)^2 \times 10^{-3}$$

$$1 = V_{GSt} - 1$$

$$V_{GSt} \simeq 2\,V$$

$$V_{DSt} = V_{GSt} - V_{TN} = 1\,V$$

$$R_D = \frac{V_{DD} - V_{DSQ} - V_S}{I_{DQ}}.$$

$$= \frac{14 - 2.3 - 1.2}{400 \times 10^{-6}}$$

$$= 26.25 \text{ k}\Omega$$

$$I_{DQ} = K_n (V_{nsQ} - V_{TN})^2$$

$$400 \times 10^{-6} = 1 (V_{nsQ} - 1)^2 \times 10^{-3}$$

$$400 \times 10^{-3} = 1 (V_{nsQ} - 1)^2$$

$$0.632 = V_{nQ} - 1$$

$$V_{nsQ} = 1.632 \text{ V}$$

The Voltage

$$V_{nsQ} = \frac{R_2}{R_1 + R_2} V_{DD}$$

$$= \frac{R_i}{R_1} V_{DD}$$

$$R_i = R_1 // R_2 = 100 \text{k}\Omega$$

$$V_{nsQ} = \frac{100 \times 14}{R_1}$$

$$R_1 = \frac{100 \times 14}{1.632}$$

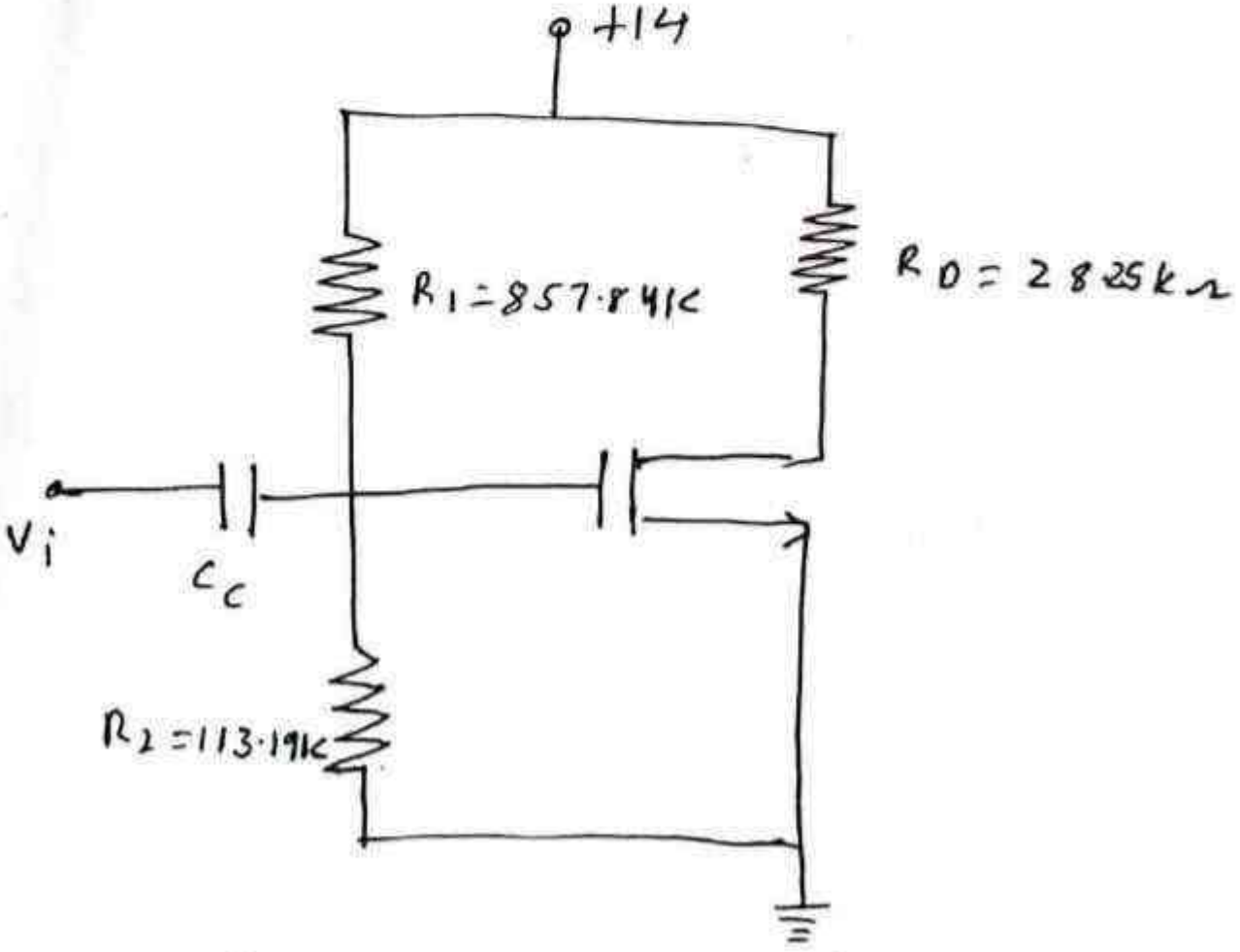
$$= 857.84 \text{k}\Omega$$

$$R_i = \frac{R_1 R_2}{R_1 + R_2}$$

$$100 = \frac{857.84 \times R_2}{R_2 + 857.84}$$

$$R_2 = \frac{100 \times 857.84}{757.84} = 113.19 k\Omega.$$

$R_1 = 857.84 k\Omega \quad R_2 = 113.19 k\Omega$.



NMOS Voltage divider bias.

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Course Name; VLSI DESIGN

Year / Sem: IIIB.Tech/II Sem

AY: 2023-2024

Faculty Name: P.Girish

Course Code: C322

Instructional Methods / Pedagogical Initiatives

1. **NPTEL VIDEO**
   LINK:
   https://www.youtube.com/watch?v=IRpt1fCHd8Y&list=PLCmoXVuSEVHlEJi3SwdyJ4EICffuyqpjk

Faculty Signature

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Experiential Learning

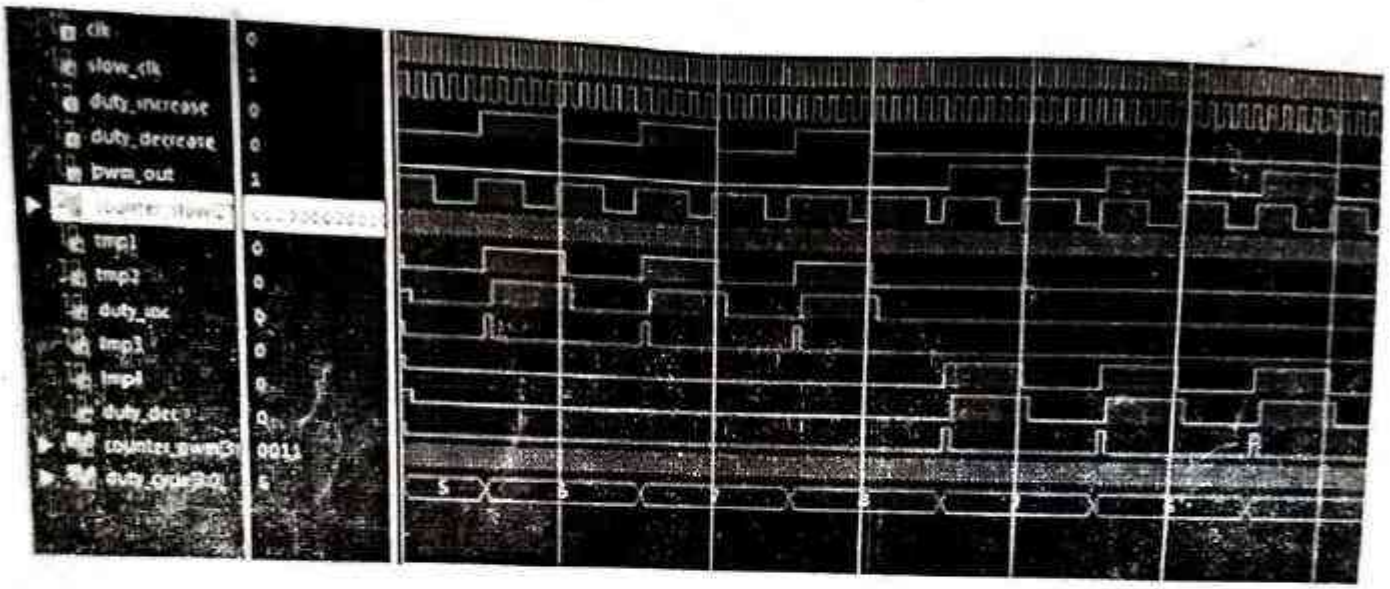
Course Name:	VLSI DESIGN	Year / Sem:	IIIB.Tech/II Sem
AY:	2023-24	Faculty Name:	P.Girish
Course Code:	C322		

VHDL code for PWM Generator with Variable Duty Cycle:

```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;
USE IEEE.STD_LOGIC_UNSIGNED.ALL;

entity PWM_Generator is
port (
  clk: in std_logic;
  DUTY_INCREASE: in std_logic;
  DUTY_DECREASE: in std_logic;
  PWM_OUT: out std_logic
  );
end PWM_Generator;

architecture Behavioral of PWM_Generator is

component DFF_Debounce
Port (
CLK : in std_logic;
en : in std_logic;
D : in std_logic;
Q : out std_logic
);
end component;
signal slow_clk_en: std_logic:='0';
signal counter_slow: std_logic_vector(27 downto 0):=(others => '0');
signal tmp1,tmp2,duty_inc: std_logic;
signal tmp3,tmp4,duty_dec: std_logic;
signal counter_PWM: std_logic_vector(3 downto 0):=(others => '0');
signal DUTY_CYCLE: std_logic_vector(3 downto 0):=x"5";
begin

process(clk)
begin
if(rising_edge(clk)) then
counter_slow <= counter_slow + x"0000001";

if(counter_slow = x"0000001") then
```

```
 counter_slow <= x"0000000";
 end if;
 end if;
end process;
slow_clk_en <= '1' when counter_slow = x"000001" else '0';

stage0: DFF_Debounce port map(clk,slow_clk_en , DUTY_INCREASE, tmp1);
stage1: DFF_Debounce port map(clk,slow_clk_en , tmp1, tmp2);
duty_inc <= tmp1 and (not tmp2) and slow_clk_en;

stage2: DFF_Debounce port map(clk,slow_clk_en , DUTY_DECREASE, tmp3);
stage3: DFF_Debounce port map(clk,slow_clk_en , tmp3, tmp4);
duty_dec <= tmp3 and (not tmp4) and slow_clk_en;

process(clk)
begin
 if(rising_edge(clk)) then
 if(duty_inc='1' and DUTY_CYCLE <= x"9") then
  DUTY_CYCLE <= DUTY_CYCLE + x"1";
 elsif(duty_dec='1' and DUTY_CYCLE>=x"1") then
  DUTY_CYCLE <= DUTY_CYCLE - x"1";
 end if;
 end if;
 end process;
 process(clk)
 begin
 if(rising_edge(clk)) then
  counter_PWM <= counter_PWM + x"1";
  if(counter_PWM>=x"9") then
   counter_PWM <= x"0";
  end if;
 end if;
 end process;
 PWM_OUT <= '1' when counter_PWM < DUTY_CYCLE else '0';
end Behavioral;

library IEEE;
use IEEE.STD_LOGIC_1164.ALL;

entity DFF_Debounce is
Port (
 CLK : in std_logic;
 en: in std_logic;
 D : in std_logic;
 Q : out std_logic
 );
end DFF_Debounce;
architecture Behavioral of DFF_Debounce is
begin
```

```
process(CLK)
begin
 if (rising_edge(CLK)) then
 if (en='1') then
  Q <= D;
 end if;
end if;
end process;
end Behavioral;
```



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Teaching Methods Summary

A.Y: 2023-24

I Year I Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 T	T6 D	T7 BS	T8 BG	T9 SEM	T10 DT	T11 Q	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 NV	T17 EBI	T18 A	T19 DIFF	T20 ACT	T21 ASSIGN	T22 MT	T23 VL	T24 PL	T25 F	T26 EL	T27 BL
1	C111	Chemistry	✓	✓														✓					✓	✓					
2	C112	Linear Algebra and Calculus	✓										✓				✓	✓					✓						
3	C113	Basic Civil and Mechanical Engineering	✓	✓							✓												✓						
4	C114	Engineering Graphics	✓	✓									✓					✓					✓						
5	C115	Introduction to Programing	✓	✓							✓		✓																

I Year II Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 T	T6 D	T7 BS	T8 BG	T9 SEM	T10 DT	T11 Q	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 NV	T17 EBI	T18 A	T19 DIFF	T20 ACT	T21 ASSIGN	T22 MT	T23 VL	T24 PL	T25 F	T26 EL	T27 BL
1	C121	Communicative English	✓	✓										✓								✓		✓					
2	C122	Engineering Physics	✓	✓													✓	✓											
3	C123	Differential Equations & Vector Calculus	✓										✓				✓	✓											
4	C124	Basic Electrical & Electronics Engineering	✓	✓																									
5	C125	Data Structures	✓	✓														✓					✓						

II Year I Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 T	T6 D	T7 BS	T8 BG	T9 SEM	T10 DT	T11 Q	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 NV	T17 EBI	T18 A	T19 DIFF	T20 ACT	T21 ASSIGN	T22 MT	T23 VL	T24 PL	T25 F	T26 EL	T27 BL
1	C211	Mathematics III	✓										✓				✓	✓					✓						
2	C212	Object Oriented Programming through C++	✓	✓									✓										✓						
3	C213	Operating Systems	✓	✓							✓												✓						
4	C214	Software Engineering	✓	✓							✓							✓											
5	C215	Mathematical Foundations of Computer Science	✓	✓											✓								✓						

II Year II Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 T	T6 D	T7 BS	T8 BG	T9 SEM	T10 DT	T11 Q	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 NV	T17 EBI	T18 A	T19 DIFF	T20 ACT	T21 ASSIGN	T22 MT	T23 VL	T24 PL	T25 F	T26 EL	T27 BL
1	C221	Probability and Statistics	✓	✓									✓				✓	✓					✓						
2	C222	Database Management Systems	✓	✓							✓		✓																
3	C223	Formal Languages and Automata Theory	✓															✓					✓		✓				
5	C224	Java Programming	✓	✓														✓							✓				
6	C225	Managerial Economics and Financial Accountancy	✓								✓												✓						

III Year I Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 T	T6 D	T7 BS	T8 BG	T9 SEM	T10 DT	T11 Q	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 NV	T17 EBI	T18 A	T19 DIFF	T20 ACT	T21 ASSIGN	T22 MT	T23 VL	T24 PL	T25 F	T26 EL	T27 BL
1	C311	Computer Networks	✓	✓					✓														✓						
2	C312	Design and Analysis of Algorithms	✓						✓														✓						
3	C313	Data Warehousing and Data Mining	✓	✓					✓												✓		✓					✓	
4	C314	**Open Elective-I:** Fundamentals of Micro processors and Micro controllers	✓	✓							✓							✓					✓	✓					
5	C315	**Professional Elective-I:** Software Project Management	✓	✓				✓			✓							✓							✓				

III Year II Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 T	T6 D	T7 BS	T8 BG	T9 SEM	T10 DT	T11 Q	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 NV	T17 EBI	T18 A	T19 DIFF	T20 ACT	T21 ASSIGN	T22 MT	T23 VL	T24 PL	T25 F	T26 EL	T27 BL
1	C321	Machine Learning	✓	✓					✓									✓					✓						
2	C322	Compiler Design	✓						✓									✓					✓						
3	C323	Cryptography and Network Security	✓	✓					✓														✓						
4	C324	**Professional Elective-II:** Object Oriented Analysis and Design	✓	✓							✓												✓						
5	C325	**Open Elective-II:** MEAN Stack Development (Job Oriented)	✓	✓					✓														✓						

IV Year I Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 T	T6 D	T7 BS	T8 BG	T9 SEM	T10 DT	T11 Q	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 NV	T17 EBI	T18 A	T19 DIFF	T20 ACT	T21 ASSIGN	T22 MT	T23 VL	T24 PL	T25 F	T26 EL	T27 BL
1	C411	**Professional Elective-III:** Cloud Computing	✓	✓							✓												✓						
2	C412	**Professional Elective-IV:** Deep Learning Techniques	✓	✓							✓												✓						
3	C413	**Professional Elective-V:** Ethical Hacking/ MOOCS-NPTEL/SWAYAM	✓	✓																			✓						
4	C414	**Open Elective-III:** Environmental Management	✓	✓							✓												✓						
5	C415	**Open Elective-IV:** Secure Coding Techniques (Job Oriented Course)	✓	✓					✓		✓												✓						

T1. White Board With Marker & Talk (WMT)
T2. Power point Presentation (PPT)
T3. Visualization (VI)
T4. Jigsaw (JI)
T5. Tutoring (T)
T6. Discussion (D

T7. Brain Storming (BS)
T8. Buzz Group (BG)
T9. Seminar (SEM)
T10. Debate (DT)
T11. Quiz (Q)
T12. Demonstration (DEMO)

T13. Cooperative Learning (CL)
T14. Case Study (CS)
T15. Problem Solving (PS)
T16. NPTEL Video (NV)
T17. Enquiry Based Instructions (EBI)
T18 Animation (A)

T19.Differentiation(DIFF)
T20. Activity(ACT)
T21. Assignment(ASSIGN)
T22.Mock Test(MT)
T23. Virtual Labs (VL)
Participative learning(PL)

T25.Flipped(F)
T26.Experiential learning(EL)
T27.Blended learning(BL)

Coordinator

HOD

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B V C INSTITUTE OF TECHNOLOGY AND SCIENCE: BATLAPALEM

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

POWER POINT PRESENTATIONS/VIDEOS

Course : COMPUTER NETWORKS(C312) Class: III B.Tech I Sem

SNO	NAME OF THE TOPIC	TYPE OF TEACHING AID PPTS	TYPE OF TEACHING AID VIDEOS
1	Reference models- The OSI Reference Model	https://www.learnpick.in/prime/documents/ppts/details/443/osi-network-model	
2	Elementary data link Protocols	https://www.powershow.com/view/1403b7-ZWFlO/Elementary_Data_Link_Protocols_powerpoint_ppt_presentation	
3	CSMA: CSMA/CD CSMA/CA		**https://www.youtube.com/watch?v=toq20_JgeQM**
4	IEEE 802.11		https://www.youtube.com/watch?v=pgCe7qk9PZg
5	TCP Operations		https://www.youtube.com/watch?v=EO4B_ykP8f8
6	Application Layer Protocols	https://www.gatevidyalay.com/tag/application-layer-protocols-ppt/	

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FACULTY

The Data Link Layer

Chapter 3

Hybrid Reference Model - REMINDER

Application Layer
Transport Layer
Network Layer
Data Link Layer
Physical Layer

Data Link Layer

- "Virtual communication" takes place in the data link layer (in additional to the other layers).
- Provides services to the network layer
  - Framing (sending machine breaks input data into input frames). Need to recognize framing boundaries.
  - Error control - noise burst can ruin a transmission.

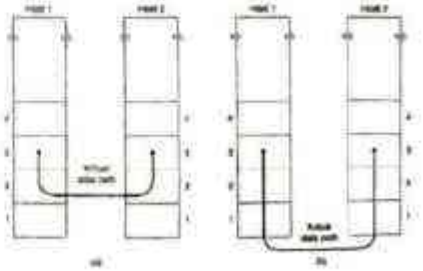
Data Link Layer

- Provides svcs to the network layer (contd)
  - Flow control - how to stop a fast transmitter from overwhelming a slow one.

Data Link Layer

- **Services Provided to Network Layer**
  - Transfer data from network layer on source machine to network layer on destination machine through "virtual communication."
  - Actual path is through all lower layers.
  - Services are 1) Unacknowledged connectionless service 2) Acknowledged connectionless service 3) Ack. Connection-oriented service

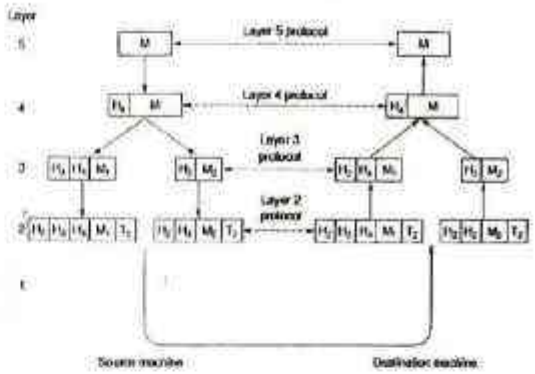
Data Link Layer



Unacknowledged connectionless service

- Source machine sends frames to destination machine. Destination machine does not ack.
- No connection estd. before hand
- Frame loss due to noise is *not recovered* in data link layer but maybe above.
- Appropriate for
  - Low error rate systems
  - real time traffic (speech) - bad data is worse than late data.

Elementary data link protocols



Elem. Data link protocols

- DLL Interaction with the Physical Layer
  - *to_physical_layer* to transmit frame
  - *from_physical_layer* to receive frame
- DLL Interaction with the Network Layer
  - *to_network_layer* to pass packet upwards
  - *from_network_layer*: get pkt from network layer
- *wait-for-event(&event)* This procedure only returns when something has happened, for example a frame arrives. *event* says what happened (e.g., *event*

Elementary data link protocols

- Frame contents - *kind, seq_no, ack, info*
  - First 3 contain control info and the last contains actual data.
  - *kind* lets us know if frame contains only control info. or if it contains control info. + data.
  - *seq_no* is used to number frames to tell them apart
  - *ack* is used for acknowledgements
  - *info* field of data frame contains a single packet. For a control frame *info* field is not used.

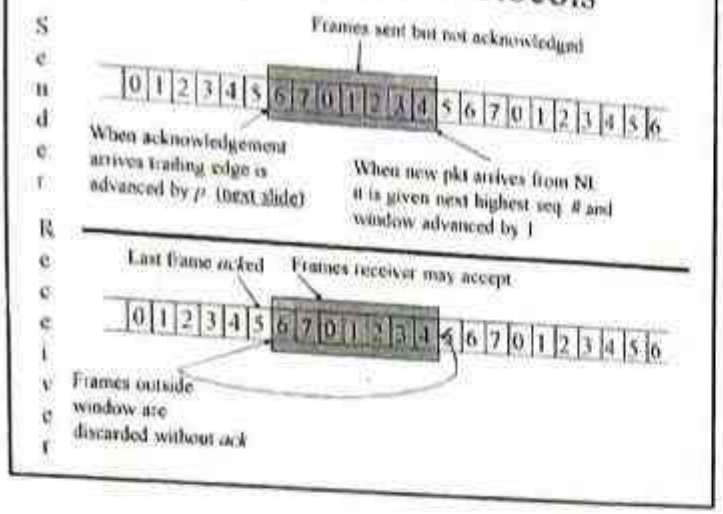
Elementary data link protocols

- **Packet and Frame:**
  - Network layer constructs a packet by taking a message from the transport layer and adds the network layer header to it.
  - Packet is then passed to DLL and put into the *info* field of the outgoing frame.
  - The destination DLL extracts the packet from the frame and sends packet to network layer (above it)

Unrestricted simplex protocol

- **Assumptions:**
  - Data transfer is unidirectional (*MAX_SEQ* is not used).
  - Transmitting and receiving network layers are always ready
  - Processing time of frames can be ignored
  - Buffer space is infinite
  - The communication channel between DLL's is always noiseless

Sliding Window Protocols



Sliding Window Protocols

- SENDER:
  - Sender maintains a list of consecutive sequence numbers corresponding to frames it is permitted to send. This list, termed the **sending window**, represents frames sent but not yet *ack*'d.
  - When an *ack* arrives, the lower edge of the window is advanced to the corresponding sequence number, thereby allowing the sender to transmit new frames. (**Note**: When receiver sends an *ack* for frame s, this is understood to mean that all frames up to and including s have been received.)

Sliding Window Protocols

- SENDER (continued):
  - Let *SWS* be the maximum sender window size.
  - Let *LAR* be the sequence number of the last acknowledgment received.
  - Let *LFS* be the sequence number of the last frame sent.
  - Therefore *LFS - LAR + 1 <= SWS*.
  - The sender must have a buffer large enough to hold as many frames as there are in its window.
  - sender records the time at which every packet is sent.

Sliding Window Protocols

- SENDER (continued):
  - If sender does not receive *ack* for packet before timeout elapses, it retransmits original frame.
- RECEIVER:
  - The receiver also maintains a **receiving window**, corresponding to the number of out-of-order frames it can accept. Frames falling outside the window are discarded without *ack*.
  - Let *RWS* be the maximum receiver window size; *HFA* be the highest-numbered frame that will be accepted & *NFE* be the next frame expected.

Sliding Window Protocols

- RECEIVER:
  - *HFA - NFE + 1 <= RWS*.
  - When frame with sequence number *s* arrives, the receiver takes the following action. If *s < NFE* or *s > HFA*, then the frame is outside the receiver's window and so it is discarded. If *NFE <= s <= HFA*, then the frame is accepted.
  - An acknowledgment for *s* is sent if the following conditions are met:
    - *s* has not yet been acknowledged.
    - all frames in the range from NFE to *s* have been received.

Sliding Window Protocols

- RECEIVER:
  - Thus the acknowledgments are cumulative.
  - When the acknowledgment is sent, the receiver sets *NFE = s + 1* and *HFA = s + RWS*.

Unrestricted simplex protocol

- Protocol has two procedures - *sender1* (runs in DLL of source machine) and *receiver1* (runs in DLL of destination machine).
  - *sender1* - fetch packet from network layer, create a frame and send frame to physical layer.
  - *receiver1*- Await arrival of frame (assumed undamaged). Take frame from physical layer and send data portion to network layer.

Simplex stop-and-wait protocol

- Eliminates the assumption that there is an infinite buffer space in the DLL in which to store all incoming frames.
- Assume communication channel is error free and data traffic is one way (more later).
- Therefore we only have to worry about how not to flood the receiver.
- If the receiver requires Δt (seconds, microseconds etc) *from_physical_layer* and *to_network_layer* then sender must send less than one frame per Δt.

Simplex stop-and-wait protocol

- Assuming no automatic buffering and queuing are done in hardware, sender must never send a new frame until receiver has *completely* taken old one through the use of *from_physical_layer*.
- Delay is not feasible if the receiver has several lines to attend to.
- Accounting for worst case behavior of the receiver is *too conservative*.
- Thus it is preferable to have receiver send feedback to sender.

Simplex stop-and-wait protocol

- After sending a packet to network layer, receiver sends a dummy frame back to sender - which effectively tells sender to send next frame.
- Thus sender is required by protocol to wait for some time - i.e., until dummy frame is received. This is known as **stop-and-wait**.
- Data traffic is *simplex* but frame traffic is *duplex*. Since strict alternation is followed, *half-duplex* is permissible.

Sliding Window Protocols

- Full duplex communication, i.e., same ckt is used to send data/ack in both directions.
- **Piggybacking:** When data frame arrives, receiver (B) instead of sending an *ack* to A immediately, waits till it has a packet to send to (A) from its network layer. The *ack* is put in the frame header. Advantage: Better bandwidth utilization. Disadvantage: Waiting for packet could take for ever. Compromise wait a fixed time for packet to send otherwise send separate *ack*.

Sliding Window Protocols

- Outbound frame has a sequence number from 0 - 2^n -1 (therefore n bits suffice)
- Sender maintains a list of numbers in sequence corresponding to frames it is permitted to send. This set of frames falls within the so-called **sending window**.
- Receiver maintains a similar list of frames it is permitted to accept called a **receiving window**.
- Sending & receiving window can have diff sizes, upper/lower limits & can grow/shrink

Go back n

- **Pipelining:**
  - Assumption was that trans. time is negligible
  - Eg. 50Kbps channel, 500ms round trip propagation delay. Send 1000bit frames. t=0 ms the first fame is sent. t=270ms is when frame fully arrives at receiver and only at t = 520ms has the *ack* arrived back at the sender.
  - Sender was blocked 500/520 or 96% of time.
  - Solution: Choose *w* frames before blocking. In example above, w = 26, i.e, by the time it has sent 26 frames (t=520) the *ack* for 0 will have arrived. This is known as **pipelining**.

Go back n/selective repeat

- **Pipelining:** (continued)
  - If channel capacity is *b* bps, frame size *l* bits & the round trip propagation time *R* sec, the time required to send a single frame is *l/b* sec.
  - There will be a total channel delay of *R* sec
  - In stop-and-wait line is busy for *l/b* and idle for *R* sec giving a line utilization for $l/(l+bR)$.
  - Thus pipelining can be used to keep the line busy in the interval.
  - What to do if errors occur during pipelining?
  - Answer: **go back n**, or **selective repeat**

Go back n/selective repeat

- **go back n :**
  - What to do when a frame in the middle of a long stream is bad? Large # of succeeding frames may come to receiver before sender is told of error.
  - On discovering error, a solution is **go back n**. Here receiver discards all subsequent frames (upto n) & sends no *ack* for the discarded frames. Therefore the receiver DLL refuses all frames but the next one it must give to the NL.
  - Eventually sender will retransmit all frames including lost/damaged one.

Go back n/selective repeat

- **Selective repeat :**
  - Store all frames following the bad one.
  - When sender notices that something is wrong it only retransmits the bad frame.
  - This is like having a receiver window larger than 1
  - Thus any frame within the window may be accepted and buffered until all the preceding ones have been passed to the network layer.
  - Could need large amounts of memory in DLL

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

ASSIGNMENT QUESTION PAPERS MAPPED WITH CO AND BT

Course : COMPUTER NETWORKS
AY: 2023-24

Class: *III* B.Tech I Sem

ASSIGNMENT QUESTIONS	Course Outcome #	Taxonomy Level
ASSIGNMENT-1 1. Write in detail about OSI reference model 2. Explain the layers responsibilities of OSI model 3. Explain any 4 topologies in network arrangment 4. Differences of OSI and TCP/IP 5. Define transmission media and its type	**C311.1**	understand
ASSIGNMENT-2 1. Write about elementary data link protocols 2. What is CRC with an example. 3. Write about error correction method with hamming code example 4. Explain Go-back N sliding window protocol	**C311.2**	Analyze
ASSIGNMENT-3 1. Write Random Access Control Methods 2. Explain Channelization Methods 3. What is Ethernet .Explain Standard Ethernet with its Implementation 4. Explain Fast Ethernet	**C311.3**	Analyze
ASSIGNMENT-4 1. Explain the Implementation of Connection Oriented and Connectionless Service 2. Explain DVR With an Example 3. What is SPR. Perform its two methods by an Example 4. Explain IPV4 frame format	**C311.4**	Evaluate
ASSIGNMENT-5 1. Explain the TCP Connection Oriented Service 2. What is DNS Write its Methods 3. Define E-mail Explain its Architecture	**C311.5**	Apply

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DEPARTMENT OF CSE-AI&DS

Teaching Methods Summary

A.Y: 2023-24

I Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	MT	ASSIGN	MT	VL	PL	F	EL	BL
1	C111	CE	✓	✓										✓								✓		✓					
2	C112	LAC	✓	✓													✓	✓											
3	C113	BCME	✓										✓				✓	✓											
4	C114	EG	✓	✓																									
5	C115	IOP	✓	✓														✓					✓						

I Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	ASIGN	MT	ASSIGN	MT	VL	PL	F	EL	BL
1	C121	CE	✓	✓			✓	✓					✓				✓	✓					✓						
2	C122	EP	✓	✓			✓			✓	✓												✓						
3	C123	DEVC	✓	✓			✓			✓	✓												✓						
	C124	BEEE	✓	✓			✓				✓							✓											
4	C125	DS	✓	✓						✓	✓												✓						
5	C126																												

II Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	TECH	ASSIGN	MT	VL	PL	F	EL	BL
1	C211	M-III	✓	✓			✓	✓					✓				✓	✓					✓						
2	C212	MFCS	✓	✓			✓			✓	✓												✓						
3	C213	AI&DS	✓	✓			✓			✓	✓												✓						
4	C214	JAVA	✓	✓			✓				✓							✓											

5	C215	DBMS	✓	✓						✓	✓											✓							

IIYear II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	WR	DIF	ACT	PS	MT	VL	PL	F	EL	BL
1	C221	P&S	✓										✓				✓	✓					✓						
2	C222	CO	✓	✓							✓		✓																
3	C223	DWM	✓	✓														✓					✓		✓				
4	C224	FLAT	✓															✓							✓				
5	C225	MEFA	✓	✓							✓												✓						

III Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	TECH	ASSIGN	MT	VL	PL	F	EL	BL
1	C311	CD	✓	✓							✓																		
2	C312	OS	✓						✓									✓					✓						
3	C313	ML	✓	✓					✓		✓												✓						
4	C314	FMPMC	✓	✓							✓												✓						
5	C315	SE	✓	✓							✓												✓						

III Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	ACT	DIF	ASIGN	MT	VL	PL	F	EL	BL
1	C321	CN	✓	✓					✓		✓												✓						
2	C322	BDA	✓	✓							✓												✓						
3	C323	DAA	✓	✓					✓								✓						✓	✓					
4	C324	DL	✓	✓							✓												✓						
5	C325	BEE	✓	✓							✓												✓						

IV Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	ACT	ASSIGN	MT	VL	PL	F	EL	BL
1	C411	BC	✓	✓					✓		✓							✓					✓						
2	C412	CC	✓	✓	✓						✓						✓						✓						
3	C413	AI	✓	✓							✓							✓					✓						
4	C414	DC	✓	✓							✓							✓					✓						
5	C415	EM	✓								✓							✓					✓						
6	C415	UHV	✓	✓							✓												✓						

T1. White Board With Marker & Talk (WMT) T7. Brain Storming (BS) T13. Cooperative Learning (CL) T19.Differentiation(DIFF) T25 Flipped(F)

T7. Power point Presentation (PPT)

T8. Buzz Group (BG)

T9. Seminar (SEM)

T10. Debate (DT)

T11. Quiz (Q)

T12. Demonstration (DEMO)

T14. Case Study (CS)

T15. Problem Solving (PS)

T16. NPTEL Video (NV)

T17. Enquiry Based Instructions (EBI)

T18 Animation (A)

T20. Activity(ACT)

T21. Assignment(ASSIGN)

T22.Mock Test(MT)

T23. Virtual Labs (VL)

T24 Participative learning(PL)

T26.Experential learning(EL)

T27.Blended learning(BL)

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TEACHING METHODOLOGY:

1. CHALK & TALK:

   Usage of black board, chalk and lecture

2. PPT(POWER POINT PRESENTATION)

   Power point presentation for the following topics

   - Big data analytics
   - Introduction to Hadoop
   - Introduction to Hive

3. SEMINAR: Seminars by the students □ Stream processing in big data

   - Hadoop distributed file system
   - Applications on big data using pig and Hive

4. CO OPERATIVE LEARNING:

   Grouping the students with one advanced learner in each group and allowing them to discuss the topic

   - Fundamentals of Hbase and Zookeeper

5. ASSIGNMENT :

   Given important questions as assignments from all the units

2. PPT (POWER POINT PRESENTATION)

Power point presentation for the following topics

- Big data analytics
- Introduction to Hadoop
- Introduction to Hive

Relation to Smart Cities and IoT

- World economic forum ranking HK's infrastructure: #1
  - Maintain the lead in IT infrastructure
- East Kowloon Project: Energizing Hong Kong via Smart Cities
- Big Data:
  - IoT provides the infrastructure for collecting the data – Smart Cities as important application goal

Research Objectives

- **Big Data Analytics: data mining and machine learning**
  - Large-scale machine learning, data mining and data visualization
- **Big Data** Computing: data center support for Analytics
  - Big data collection and transformation, integration and distributed data management and computing
- **Big Data Theory, Privacy&Security issues on Analytics**
  - Big data sampling and statistical theory; Big data security and privacy
- **Big Data Science: 4th Paradigm – Analytics for Science and Engineering**
  - Big Data and Multi-disciplines (Bio, Chemistry, Engineering, Social)

Big data & Biology

Why Hong Kong is Ready for the Theme

- We have the best researchers in machine learning, data mining, data management, sensor networks, statistics, and multidisciplinary research such as bioinformatics
  - China National 973 Projects on Big Data
  - IEEE Transactions on Big Data: EIC
  - ACM KDD Conferences: PC and Conference Chairs
  - Winner of Big Data related international competitions
- New industries based on lots of data
  - Financial industry, logistics industry, education sector, government services, etc.
- We have many potential collaborators and partners
  - Huawei, Tencent, Baidu, Alibaba, Google, Microsoft, etc.

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF CSE-ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Big Data Analytics

TEACHING METHODOLOGIES: Seminar

TOPIC: Hadoop distributed file system

1	21H41A4501	A Sai Karishma
2	21H41A4506	A Lakshmi Shiny
3	21H41A4511	CH Deekshitha
4	21H41A4520	D Sahitya
5	21H41A4525	G Alisha

TEACHING METHODOLOGIES: Cooperative Learning

TOPIC: 1.Fundamentals of Hbase and Zookeeper

2.Applications on Big data analytics

3.Discussion on Pig and Hive

1	21H41A4510	CH Satya Durga
2	21H41A4538	L S S Meghana
3	21H41A4544	N Sandhya Rani
4	21H41A4546	P Sai Sri Swapna
5	21H41A4548	P Lakshmi Ratnam
6	21H41A4549	P Kalpana Devi
7	21H41A4558	T Poojitha
8	21H41A4565	Y T S Ambica

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DEPARTMENT OF CSE-ARTIFICIAL INTELLIGENCE &DATA SCIENCE

Big Data Analytics

5 Assignment:

		co	Taxonomy level
1	1. Draw HDFS Architecture. Explain any two commands of HDFS from the following commands with syntax atleast one example of each. 2. What is Big data? Explain characteristics of Big data. 3. What is Map reduce? Explain working of various phases of Map reduce with appropriate example and diagram.	C322.1	UNDERSTAND
2	1. What is Hadoop ecosystem? Discuss various components of Hadoop ecosystem. 2. What do you mean by HiveQL Data Definition Language? Explain any three HiveQL DDL command with syntax and example. 3. Difference between HDFS and Hbase?	C322.2	ANALYZE
3	1. Explain Spark components in detail? Also list the features of Spark. 2. What is NoSQL database? List the difference between NoSQL and Relational database. Explain in brief various types of NoSQL databases. 3. Explain scaling in MongoDB?	C322.4	UNDERSTAND

Principal

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BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF AI&ML

Teaching Methods Summary

A.Y: 2023-24

I Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	MT	VL	MT	VL	PL	F	EL	BL
1	C111	CE	✓	✓														✓					✓	✓					
2	C112	LAC	✓									✓					✓	✓					✓						
3	C113	BCME	✓	✓							✓												✓						
4	C114	EG	✓	✓								✓						✓					✓						
5	C115	IOP	✓	✓							✓	✓																	

I Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIFF	ACT	ASSIGN	MT	VL	PL	F	EL	BL
1	C121	CE	✓	✓										✓								✓		✓					
2	C122	EP	✓	✓													✓	✓											
3	C123	DEVC	✓										✓				✓	✓											
4	C124	BEEE	✓	✓																									
5	C125	DS	✓	✓														✓					✓						

II Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	ACT	ASSIGN	MT	VL	PL	F	EL	BL
1	C211	M-III	✓	✓			✓	✓					✓				✓	✓					✓						
2	C212	MFCS	✓	✓			✓			✓	✓												✓						
3	C213	AI&ML	✓	✓			✓			✓	✓												✓						
4	C214	JAVA	✓	✓			✓				✓							✓											

5	C215	DBMS	✓	✓						✓	✓												✓						

IIYear II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	WR	DIF	ACT	ASSIGN	MT	VL	PL	F	EL	BL
1	C221	P&S	✓										✓				✓	✓					✓						
2	C222	CO	✓	✓							✓		✓																
3	C223	DWM	✓	✓														✓					✓		✓				
5	C224	FLAT	✓															✓							✓				
6	C225	MEFA	✓	✓							✓												✓						

III Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	ACT	ASSIGN	MT	VL	PL	F	EL	BL
1	C311	CD	✓	✓							✓												✓						
2	C312	OS	✓						✓									✓					✓						
3	C313	ML	✓	✓					✓		✓												✓						
4	C314	FMPMC	✓	✓							✓												✓						
5	C315	SE	✓	✓							✓												✓						

III Year II Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
			WMT	PPT	VI	JI	T	D	BS	BG	SEM	DT	Q	DEMO	CL	CS	PS	NV	EBI	A	DIF	ACT	ASIGN	MT	VL	PL	F	EL	BL
1	C321	CN	✓	✓					✓		✓												✓						
2	C322	DL	✓	✓							✓												✓						
3	C323	DAA	✓	✓					✓								✓						✓	✓					
4	C324	IOT	✓	✓							✓												✓						
5	C325	BEE	✓	✓							✓												✓						

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BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

BIG DATA ANALLYTICS

TEACHING METHODOLOGY:

1. CHALK & TALK:

   Usage of black board, chalk and lecture

2. PPT(POWER POINT PRESENTATION)

   Power point presentation for the following topics

   - Big data analytics
   - Introduction to Hadoop
   - Introduction to Hive

3. SEMINAR: Seminars by the students □ Stream processing in big data

   - Hadoop distributed file system
   - Applications on big data using pig and Hive

4. CO OPERATIVE LEARNING:

   Grouping the students with one advanced learner in each group and allowing them to discuss the topic

   - Fundamentals of Hbase and Zookeeper

5. ASSIGNMENT :

   Given important questions as assignments from all the units

2. PPT (POWER POINT PRESENTATION)

Power point presentation for the following topics

- Big data analytics
- Introduction to Hadoop
- Introduction to Hive

The Power of Big Data

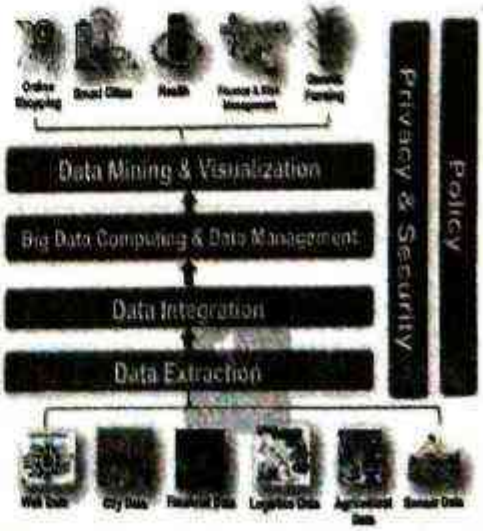
- Big Data can bring "**big values**" to our life in almost every aspects.
- Technologically, Big Data is bringing about changes in our lives because it **allows diverse and heterogeneous data to be fully integrated and analyzed to help us make decisions.**
- Today, with the Big Data technology, **thousands of data from seemingly unrelated areas can help support important decisions.** This is the power of Big Data.
- Areas of Applications
  - Health and Well being
  - Policy making and public opinions
  - Smart cities and more efficient society
  - New online educational models: MOOC and Student-Teacher reviews
  - Robotics and human-robot interaction
- Much of this power hinges on Research on Analytics

Hong Kong needs Big Data Research

1. to develop state-of-the-art Big Data platform in research, education and industrial applications, and open it to the Hong Kong society and the world at large, and

2. to make a difference in Smart Cities, Health and Well-being (including supporting aging populations), and modernizing Finance, Education and Logistics in Hong Kong.

Big Data Analytics Objectives



Relation to Smart Cities and IoT

- World economic forum ranking HK's infrastructure: #1
  - Maintain the lead in IT Infrastructure
- East Kowloon Project: Energizing Hong Kong via Smart Cities
- Big Data:
  - IoT provides the infrastructure for collecting the data – Smart Cities as important application goal

Research Objectives

- Big Data Analytics: data mining and machine learning
  - Large-scale machine learning, data mining, and data visualization
- Big Data Computing: data center support for Analytics
  - Big data collection and transformation, integration and distributed data management and computing
- Big Data Theory, Privacy/Security issues on Analytics
  - Big data sampling and statistical theory, Big data security and privacy
- Big Data Science: 4th Paradigm – Analytics for Science and Engineering
  - Big Data and Multi-disciplines (Bio, Chemistry, Engineering, Social,

Big data & Biology

Why Hong Kong is Ready for the Theme

- We have the best researchers in machine learning, data mining, data management, sensor networks, statistics, and multidisciplinary research such as bioinformatics
  - China National 973 Projects on Big Data
  - IEEE Transactions on Big Data: EiC
  - ACM KDD Conferences: PC and Conference Chairs
  - Winner of Big Data related international competitions
- New industries based on lots of data
  - Financial industry, logistics industry, education sector, government services, etc.
- We have many potential collaborators and partners
  - Huawei, Tencent, Baidu, Alibaba, Google, Microsoft, etc.

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DEPARTMENT OF CSE-ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

Big Data Analytics

TEACHING METHODOLOGIES: Seminar

TOPIC: Hadoop distributed file system

1	21H41A6101	A Akhil Naidu
2	21H41A6106	CH L Sai Saranya
3	21H41A6113	G Phani vinaya
4	21H41A6120	K Harshini
5	21H41A6123	K Bhavana

TEACHING METHODOLOGIES: Cooperative Learning

TOPIC: 1.Fundamentals of Hbase and Zookeeper

2.Explantion on HIVE and PIG

1	21H41A6125	K Rani
2	21H41A6126	K Sarojini
3	21H41A6129	K Devi sirisha
4	21H41A6141	N Tharun Raju
5	21H41A6142	N N Deepika
6	21H41A6158	S Siri
7	22H45A6106	T Satish
8	22H45A6103	K Saibabu

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DEPARTMENT OF CSE-ARTIFICIAL INTELLIGENCE &DATA SCIENCE

Big Data Analytics

5 Assignment:

		CO	Taxonomy level
1	1. Draw HDFS Architecture. Explain any two commands of HDFS from the following commands with syntax atleast one example of each. 2. What is Big data? Explain characteristics of Big data. 3. What is Map reduce? Explain working of various phases of Map reduce with appropriate example and diagram.	C322.1	UNDERSTAND
2	1. What is Hadoop ecosystem? Discuss various components of Hadoop ecosystem. 2. What do you mean by HiveQL Data Definition Language? Explain any three HiveQL DDL command with syntax and example. 3. Difference between HDFS and Hbase?	C322.2	ANALYZE
3	1. Explain Spark components in detail? Also list the features of Spark. 2. What is NoSQL database? List the difference between NoSQL and Relational database. Explain in brief various types of NoSQL databases. 3. Explain scaling in MongoDB?	C322.4	UNDERSTAND

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DEPARTMENT OF MANAGEMENT STUDIES

Teaching Methods Summary

A.Y: 2023-24

I Year I Semester

S.No	Course Code	Course Name	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
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1	C111	MOB	√	√							√					√										√			
2	C112	ME	√	√												√	√	√											
3	C113	AFM	√	√												√	√	√											
4	C114	QABD	√	√													√	√								√			
5	C115	LBE	√	√							√					√										√			
6	C116	BCSS	√	√							√					√			√				√						
7	C117	RD	√	√							√					√	√								√				
8	C118	BCSS LAB	√	√																		√			√				
9	C119	IT LAB-1	√	√																									

I Year II Semester

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1	C121	FM	√	√												√	√				√								√
2	C122	HRM	√	√												√					√								√
3	C123	MM	√	√							√					√		√			√								
4	C124	OM	√	√												√					√								√
5	C125	BRM	√	√												√	√				√								√
6	C126	LM	√	√												√					√								√
7	C127	IT LAB-2	√	√												√	√				√								√

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BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF MANAGEMENT STUDIES

Teaching Methods Summary

A.Y: 2023-24

II Year I Semester

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1	C211	SM	√	√							√					√													√
2	C212	OR	√	√							√					√	√												√
3	C213	LACM	√	√							√					√													√
4	C214	PECM	√	√							√					√													√
5	C215	HCM	√	√							√					√													√
6	C216	MPRS	√	√							√					√													√
7	C213	IAPM	√	√							√					√	√												√
8	C214	MBFI	√	√					√		√					√													√
9	C215	FMS	√	√				√			√					√													√
10	C216	MACR	√	√				√			√					√	√												√
11	C213	CB	√	√							√					√													√
12	C214	RM	√	√							√					√													√
13	C215	CRM	√	√							√					√													√
14	C216	DSMM	√	√							√					√		√											√

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BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

DEPARTMENT OF MANAGEMENT STUDIES

Teaching Methods Summary

A.Y: 2023-24

II Year II Semester

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1	C221	SCMA	√	√							√					√													√
2	C222	IE	√	√							√					√													√
3	C223	IHRM	√	√							√					√													√
4	C224	ERE	√	√				√	√		√					√													√
5	C225	HRD	√	√							√					√													√
6	C226	SHRM	√	√				√			√					√													√
7	C223	FD	√	√							√					√	√												√
8	C224	GFM	√	√							√					√													√
9	C225	FRM	√	√							√					√	√												√
10	C226	SFM	√	√							√					√	√												√
11	C223	SSM	√	√			√				√					√													√
12	C224	PDM	√	√							√					√													√
13	C225	GM	√	√							√					√													√
14	C226	GMM	√	√							√					√		√											√

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DEPARTMENT OF MANAGEMENT STUDIES

A.Y: 2023-24

Subject: Marketing Management (C123)

SEM : I –II

Teaching Methods :

1. PPT
2. SEMINAR
3. CASE STUDY
4. NPTEL VIDEO
5. ASSIGNMENT

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MARKETING MIX

Subject : Marketing Management
Class :: I MBA – II SEM

Prepared by
P. KRISHNA CHAITANAYA
Asst.Professor - DMS

Marketing mix- 4P's

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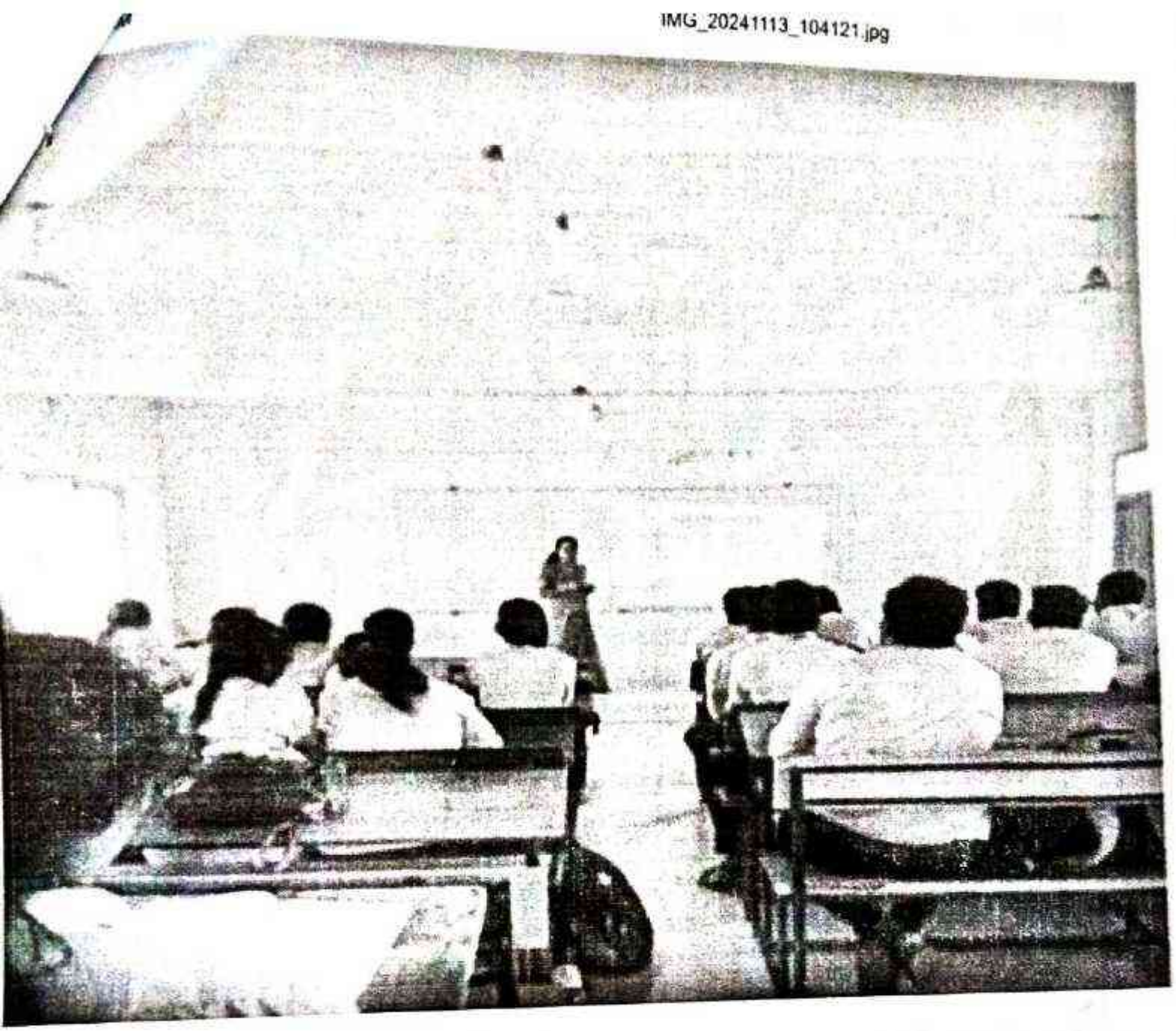

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Regno : 23H41E00411

Topic : Public Relations

What is public relations ? Say its functions ?

Introduction

The part of public relations that is most directly related to promoting a company's product or services is called publicity

publicity has been defined as the activity of securing editorial space, as divorced from paid space, in all media read, viewed, or heard by a company

The main function of publicity is to encourage and develop attitude and behaviour which will create understanding between an organization and its public & healthy growth. It is a form of communication.

Definition

"public relations is the management function which evaluates public attitudes, identifies the policies and procedures of an organization with the public interest and an organization with the public interest and executes a programme of action and communication to earn public cum understanding & acceptance".

Rex F. Marston

communicating With the Customers

Apart from quality and price of the product customer relations has become an important factor in influencing the customer's behaviour and attitudes and thus developing a better image of the product in their minds.

The first thing in maintaining customer relations is to inform the customers all about the product and then asses what they know about it.

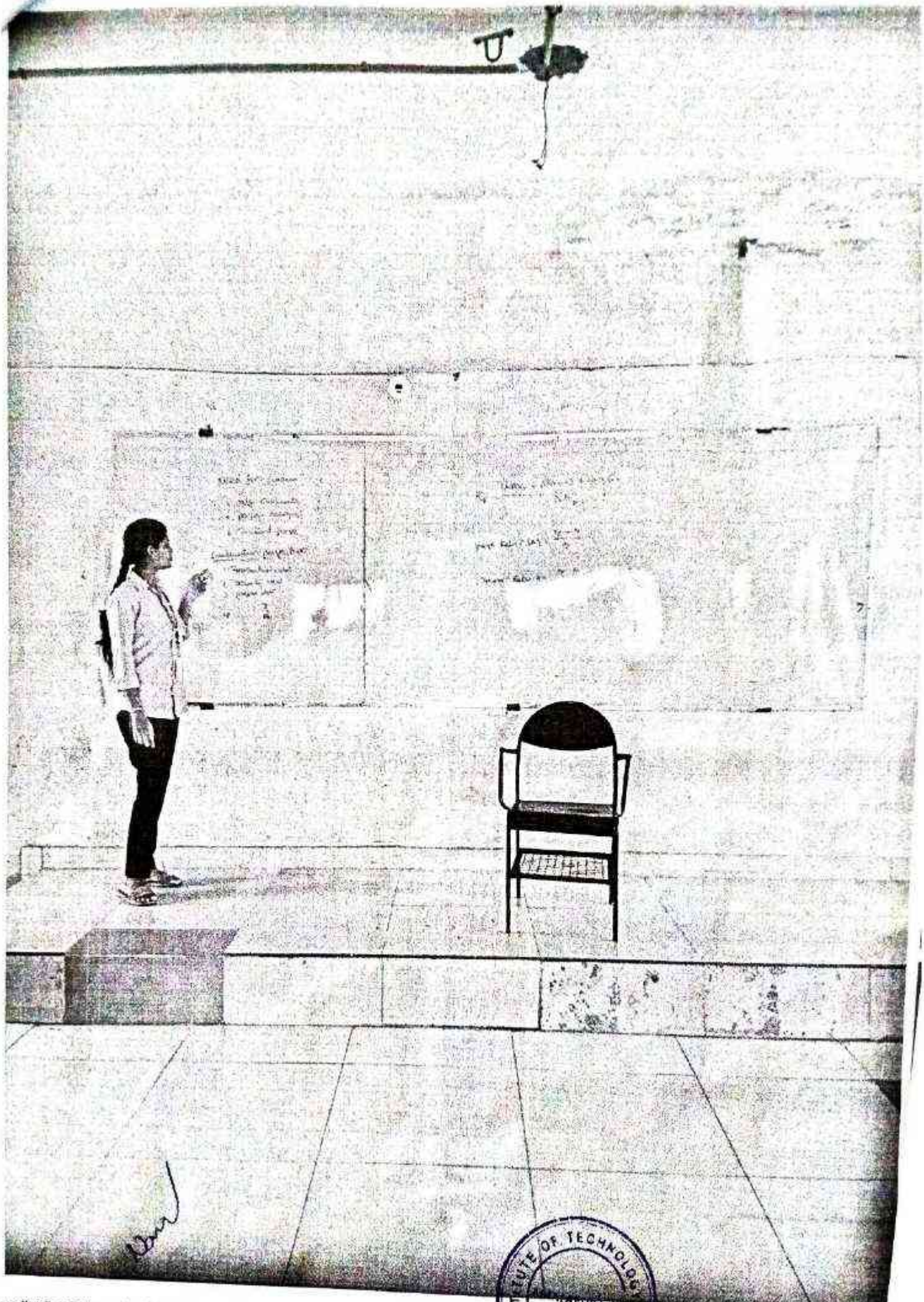
(4) communicating With the General public

Communication With public is altogether essential in developing a corporate image in the minds of the general public. It is, therefore, necessary for the business to realize its Social responsibility towards the public at large.

first, the manufacturer must popularize a code of fair trade practice to have a check on the unscrupulous activities of the traders and retailers from rigging up prices When temporary Shortages occur.

(5) communicating With the Employees

Industrial relations have been described as an area workers have to be reconciled With the not too plentiful resources of Industry.



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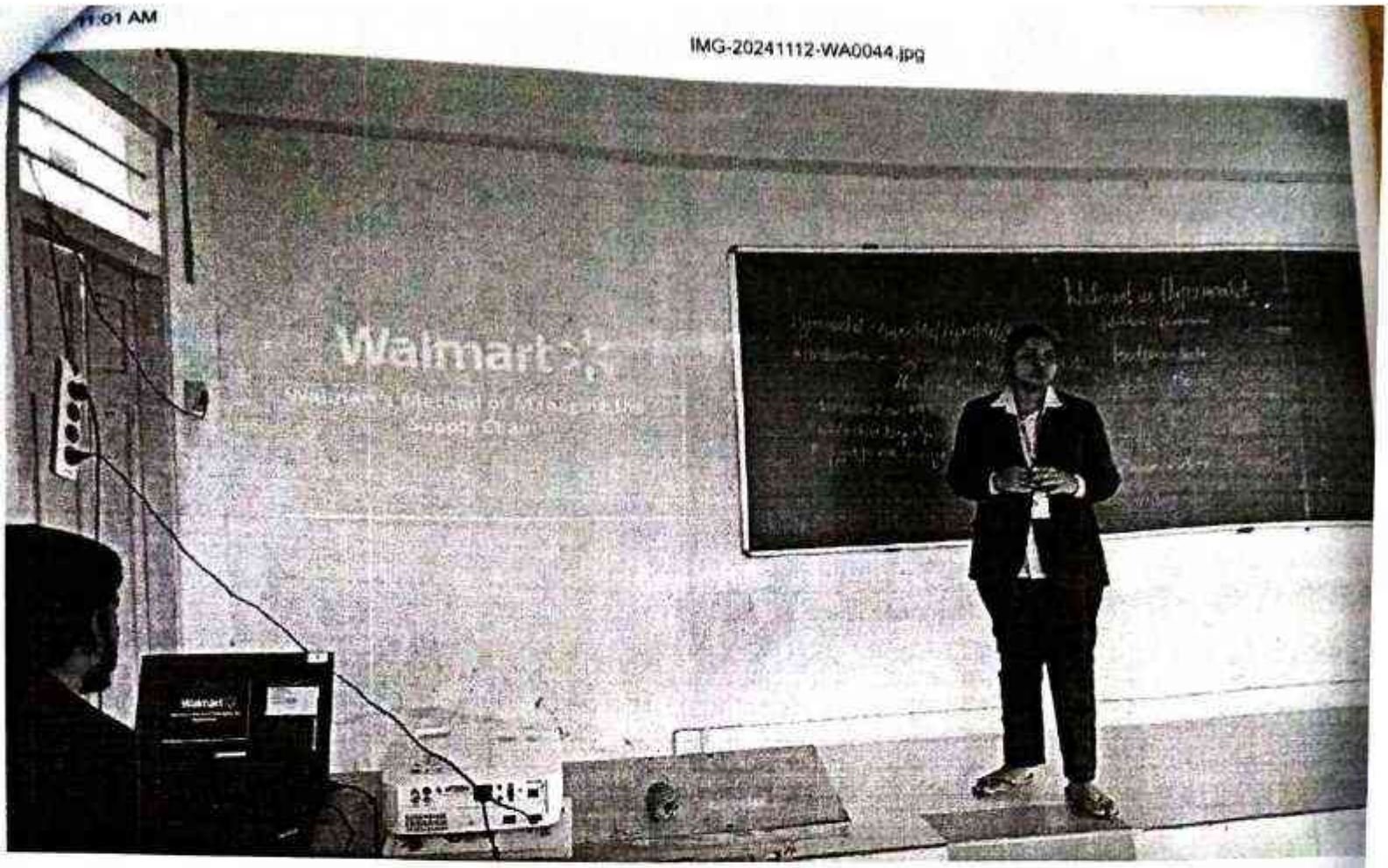

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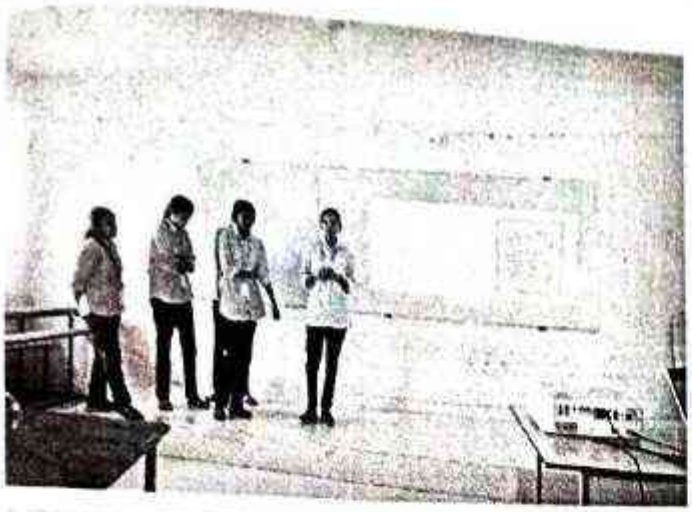
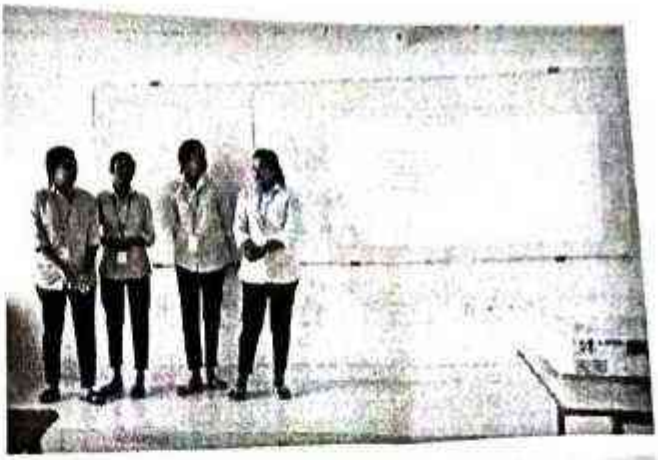
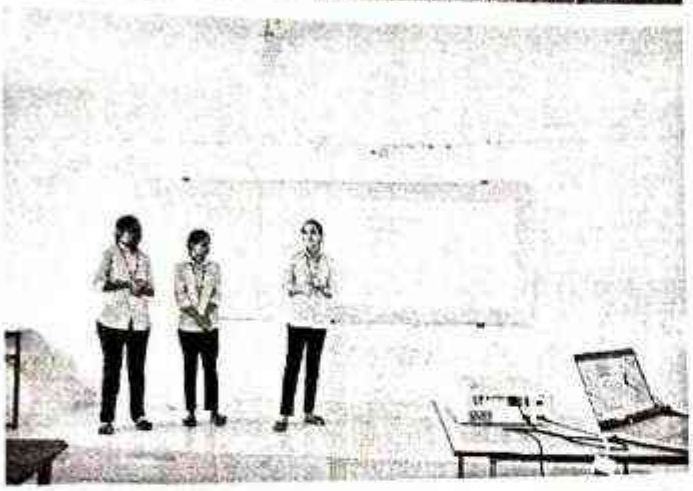
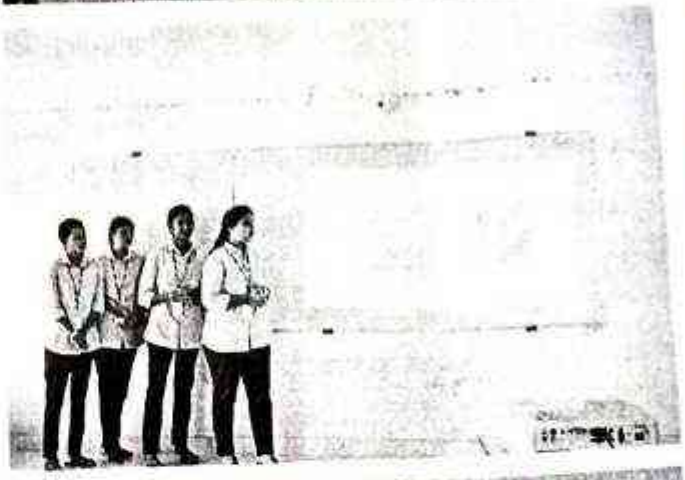
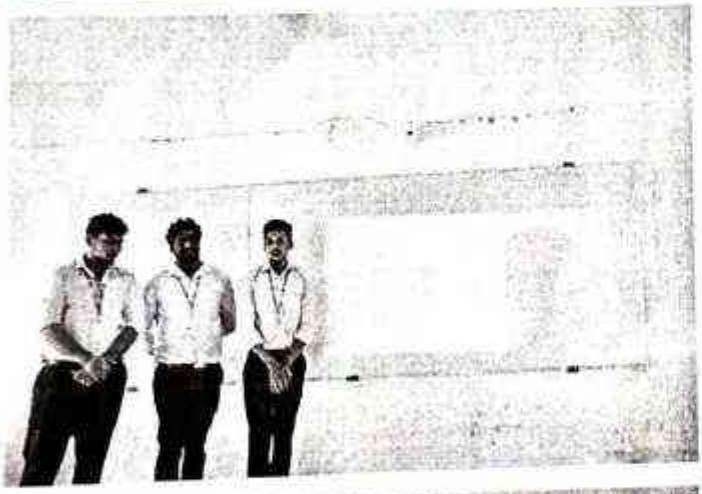
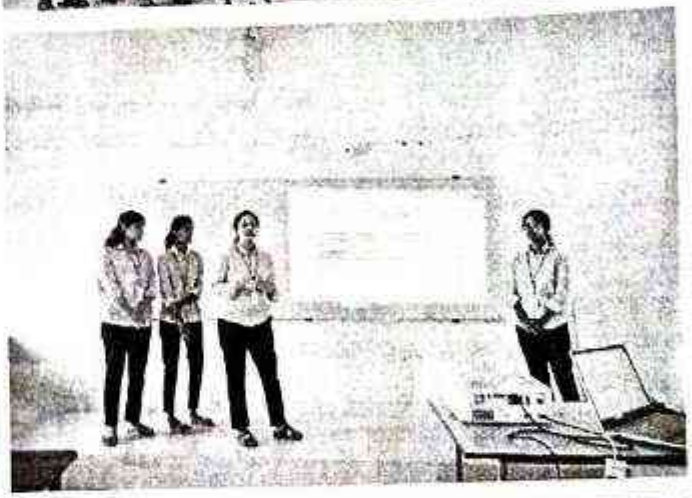
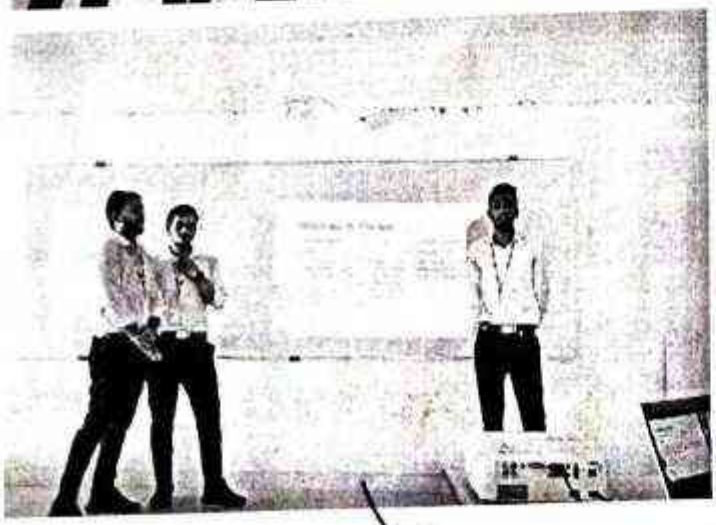


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Case Study on Zomato

1.How Zomato used data and analytics to personalize its marketing campaigns and improve customer engagement.

Introduction

Zomato is a popular food delivery and restaurant-finding app in India that has become famous for smartly using data to make decisions. This helps them create marketing plans that really connect with customers. In this case study, we look at the strategies of Zomato.

Background

Before Zomato entered the food delivery and restaurant discovery market, diners in India faced challenges in finding and ordering food from their favorite restaurants.

Zomato aimed to simplify this process by providing a platform that offered restaurant listings, user reviews, and online food ordering services. However, Zomato realized the importance of differentiating itself through personalized marketing strategies as competition grew.

Marketing Strategies

- Zomato Gold- Zomato introduced a premium membership program called Gold to reward loyal customers and boost engagement. Subscribers of Zomato Gold receive complimentary dishes and exclusive discounts at

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partner restaurants. This program attracted new customers and encouraged existing users to stay committed to the platform.

- Data-Driven Personalization- Zomato used data to customize marketing campaigns. By examining user preferences, order histories, and location data, Zomato could suggest restaurants and dishes that matched individual tastes. This data-focused approach significantly improved user experiences and increased the frequency of orders.
- Localized Marketing- Zomato adopted a localized marketing strategy by customizing promotions and offers based on specific geographic areas. This approach allowed Zomato to connect with customers personally, highlighting nearby dining options and cuisine preferences.
- Social Media Engagement- Zomato actively interacts with users on social media platforms, responding to reviews and comments. The company also executed creative social media campaigns, encouraging users to share their dining experiences.

Impact

Zomato's data-driven marketing strategies have had a significant impact on the company's growth and customer engagement:

- Increased Customer Loyalty- Zomato Gold's loyalty program motivated customers to use the platform more frequently and contributed to higher customer retention rates.

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- Improved Customer Experience- Personalized recommendations embedded in data analysis significantly enhanced overall user experiences, encouraging higher levels of user satisfaction.
- Enhanced Brand Visibility- Zomato's active social media presence and user engagement efforts increased brand visibility and positive word-of-mouth marketing.

Final Note

Zomato's rise in the highly competitive food delivery and restaurant discovery market is a testament to its adept use of data in marketing management. Through their various initiatives, the company has retained a dedicated customer base and expanded its market reach. This case study underscores the significance of data-driven decision-making in modern marketing, showcasing its ability to enhance customer engagement and promote brand loyalty.

Questions for Discussion

- How did Zomato Gold's loyalty program impact customer retention and order frequency, and how did data analytics contribute to its success?
- What specific data and analytics techniques did Zomato use to personalize marketing campaigns and improve customer experiences?
- In the face of growing competition in the food delivery industry, how can Zomato continue to use data for innovative marketing strategies?

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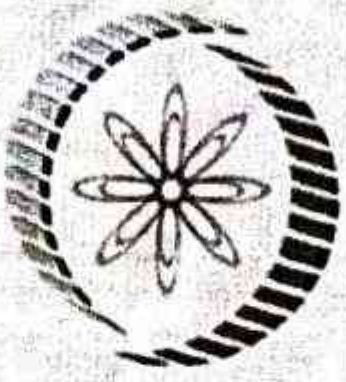

National Programme on Technology Enhanced Learning (NPTEL)

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Course Title

Marketing Management - 1

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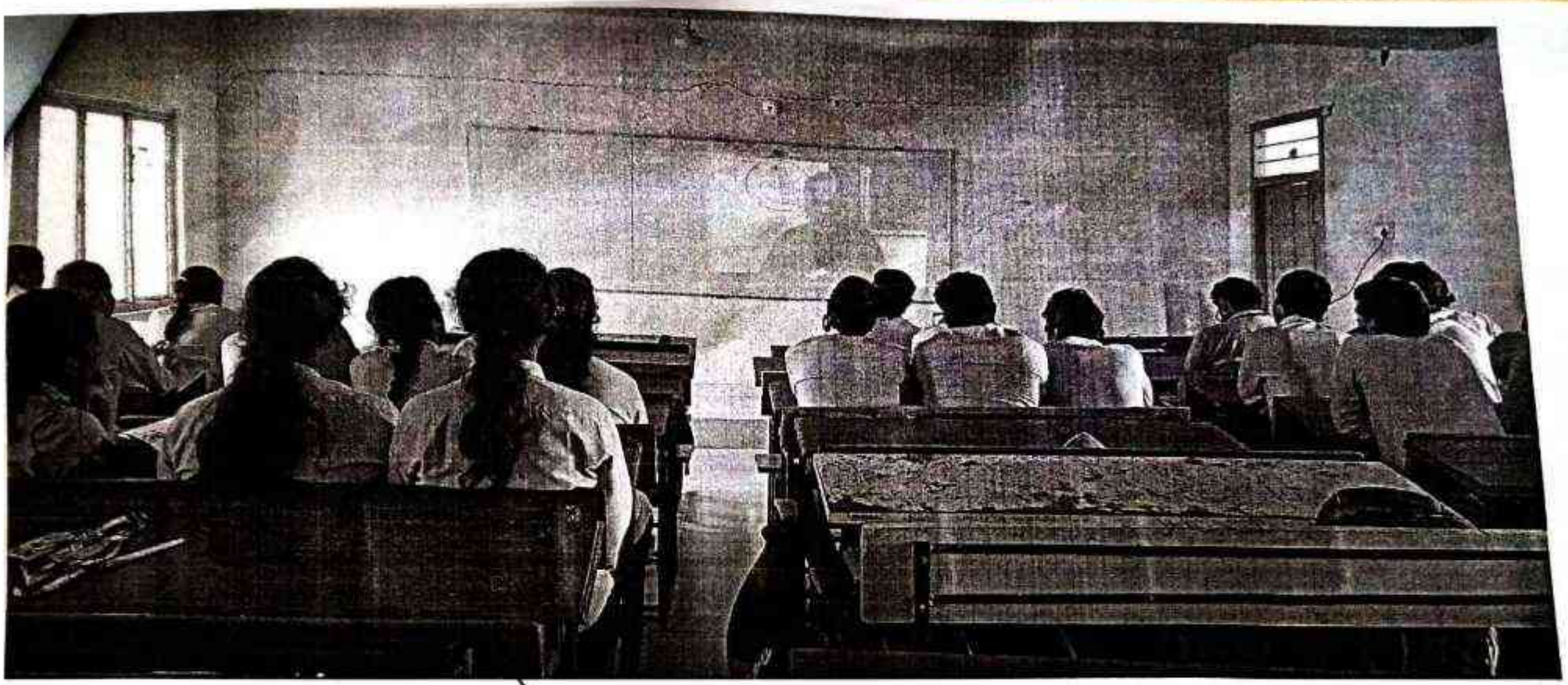

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Types of Pricing Stratagies Adopting Price....

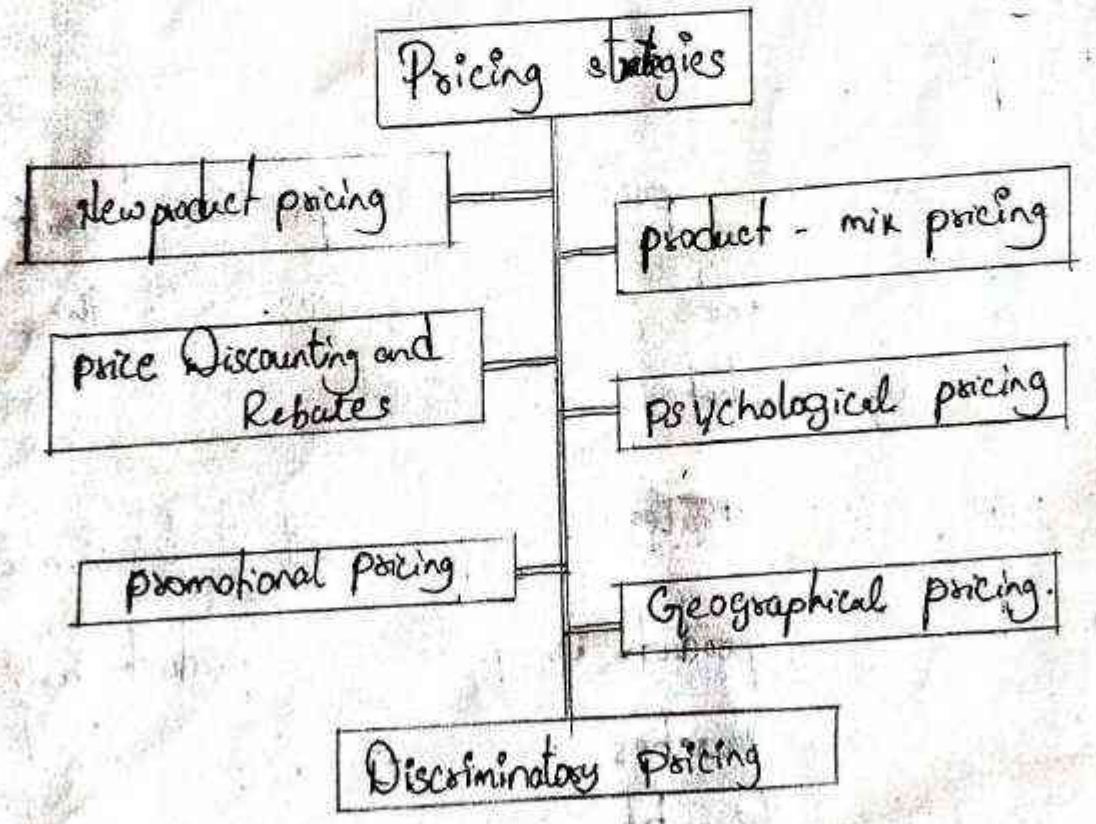
Name : R. Bindu Madhavi

Branch : MBA

Reg NO : 22HU1E0039

Explain different types of pricing strategies adopting price?

1) Different types of pricing strategies adopting price. Refers to the various approaches that companies use to set price for their products or services. These strategies help businesses determine how to price their offerings to attract customers, maximize profits, or gain a competitive edge in the market. Each pricing strategy involves different considerations and tactics to achieve specific business goals. If your have.



2) New product pricing:-

Pricing a new product is an especially challenging decision problem. The new product

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DEPARTMENT OF COMPUTER APPLICATIONS

Teaching Methods Summary

A.Y. 2023-2024

II Year I Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 I	T6 DI	T7 BS	T8 BD	T9 SEM	T10 DT	T11 G	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 MV	T17 EBI	T18 A	T19 DIFT	T20 ACT	T21 VL	T22 MT	T23 VL	T24 PL	T25 P	T26 KL	T27 BL
1	R23IFC111	BC	✓	✓							✓																		
2	R23IFC112	MSP	✓	✓													✓	✓					✓						
3	R23IFC113	CSMDN	✓	✓				✓			✓			✓															
4	R23IFC114	DS	✓	✓							✓							✓					✓						✓
5	R23IFC115	OOPS WITH JAVA	✓	✓							✓			✓				✓											

I Year II Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 I	T6 DI	T7 BS	T8 BD	T9 SEM	T10 DT	T11 G	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 MV	T17 EBI	T18 A	T19 DIFT	T20 ACT	T21 VL	T22 MT	T23 VL	T24 PL	T25 P	T26 KL	T27 BL
1	R23IFC121	DBMS	✓	✓							✓			✓				✓											
2	R23IFC122	CN	✓	✓				✓			✓			✓															
3	R23IFC123	SE&SP	✓	✓				✓	✓		✓							✓											
4	R23IFC124	DAA	✓	✓				✓	✓					✓			✓												
5	R23IFC125	HCI	✓	✓				✓						✓				✓											

II Year I Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 I	T6 DI	T7 BS	T8 BD	T9 SEM	T10 DT	T11 G	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 MV	T17 EBI	T18 A	T19 DIFT	T20 ACT	T21 ASSGN	T22 MT	T23 VL	T24 PL	T25 P	T26 KL	T27 BL
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2	R23IFC212	IOT	✓	✓					✓		✓												✓						
3	R23IFC213	BT	✓	✓				✓			✓			✓															
4	R23IFC214	DMS	✓	✓				✓			✓							✓											
5	R23IFC215	CC	✓	✓				✓	✓		✓							✓								✓			

II Year II Semester

S.No	Course Code	Course Name	T1 WMT	T2 PPT	T3 VI	T4 JI	T5 I	T6 DI	T7 BS	T8 BD	T9 SEM	T10 DT	T11 G	T12 DEMO	T13 CL	T14 CS	T15 PS	T16 MV	T17 EBI	T18 WR	T19 DIP	T20 ACT	T21 ASSGN	T22 MT	T23 VL	T24 PL	T25 P	T26 KL	T27 BL
1	2201	DSM	✓	✓				✓						✓				✓											
2	2202	ETM	✓	✓				✓			✓							✓								✓			✓

T1: Whole Board with Marker & Talk (WMT)
T2: Power point Presentation (PPT)
T3: Visualization (VI)
T4: Jigsaw (JI)
T5: Tutoring (I)
T6: Discussion (DI)
T7: Brain storming (BS)
T8: Buzz Group (B)
T9: Seminar (SEM)
T10: Demo (DT)
T11: Quiz (G)
T12: Demonstration (DEM)
T13: Collaborative Learning (CL)
T14: Case Study (CS)
T15: Problem Solving (PS)
T16: MPTEL video (MV)
T17: Enquiry based instructions (EBI)
T18: Animation (A)
T19: Differentiation (DIFT)
T20: Activity (ACT)
T21: Assignment (ASSGN)
T22: Group Tasks (GT)
T23: Virtual Labs (VL)
T24: Project (PJ)
T25: Presentation (P)
T26: Experience learning (EL)
T27: Blended learning (BL)

Coordinator

HOD-MCA

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Bonam Venkata Chalamayya Institute of Technology & Science

Department Of Computer Applications

Course Name: Data Structures

Year / Sem: I MCA/I Sem

AY: 2023-2024

Faculty Name:G.L.N.V.S.KUMAR

Course Code: C114

List of Teaching Methods

S.No	Name of Teaching Method
1	White Board With Marker & Talk (WMT)
2	Power point Presentation (PPT)
3	Seminar (SEM)
4	NPTEL Video (NV)
5	Assignment (ASIGN)
6	Blended Learning (BL)

1.PowerPoint Presentation:

2.Seminar

3. NPTEL Videos: https://www.youtube.com/playlist?list=PLgJ_V-ZKxRKrxgFyOutPJpoLFBaQMOpK-

4. Blended Learning (BL) (Face to Face)

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