# TENTATIVE LESSON PLAN: R1621031 METALLURGY & MATERIALS SCIENCE

Course Title: M	ETALLURGY	& MATERIALS SCIENCE		- X
Section : Sec	A Da	nte: 10/06/2019	Page No	o: 01 of 04
	Revision No: 00 Prepared By: D.ROGNATHA RAO Approx			ed By : HOD
Tools: Black b	oard, PPT	S		
No. of Periods		TOPIC Date		
UNIT-I Stru	cture of Me	tals and Constitution of alloys	lagrand of the	Delivery
CO1: To know	v the basic	concepts of bonds in metals and all	lovs. To under	stand the basic
requirements for TB:	the formation	on of solid solutions and other compounds		stand the basic
1	Bonds in S	Solids	11-06-2019	
-	36 - 111 - 5	•	11 00 2019	
2	Metallic B		12-06-2019	
-3	Crystalliza	ation of Metals	13-06-2019	
4	Grain and	Grain Boundaries	14-06-2019	7
5	Metal / All		15-06-2019	Lecture interspersed
6		tion of Grain Size	18-06-2019	with discussions
7	Necessity	of Alloying	19-06-2019	
8	Types of S	olid Solutions	20-06-2019	
9	Hume Rotl	nerys Rules	21-06-2019	
10	Intermedia Compound	te Alloy Phases, And Electron s	22-06-2019	
UNIT-II Eq	uilibrium D	iagrams		
TB:	s in practical		in an alloy syste	em in order to
11	Experiment Equilibrium		24-06-2019	
12	Isomorphou	us Alloy Systems	25-06-2019	
13	Equilibrium	n Cooling and Heating of Alloys	26-06-2019	
14	Lever Rule, Coring Miscibility Gaps		27-06-2019	
15	Eutectic Sy	stems	22.04.5	
16	Congruent l	Melting Intermediate Phases	28-06-2019	Lecture
			29-06-2019	

17	Peritectic Reaction	4.3	interspersed
		01-07-2019	with
18	Transformations in the Solid State		discussions
		02-07-2019	discussions
19	Allotropy, Eutectoid, Peritectoid Reactions		
		04-07-2019	
20	Phase Rule	Maria Salah Sa	
		05-07-2019	
21	Relationship Between Equilibrium Diagrams and		
	Properties of Alloys	06-07-2019	
22	Study of Important Binary Phase Diagrams of Cu-		-
	Ni Ni	08-07-2019	
23	Study of Important Binary Phase Diagrams of Al- Cu, Bi-Cd, Cu-An	08-07-2019	
24	Study of Important Binary Phase Diagrams of Cus- Sn and Fe-Fe3C	09-07-2019	

#### **UNIT-III** Cast Irons and Steels

CO3: To study the basic differences between cast irons and steels, their properties and practical applications.

-	г.	n	

25	Structure and Properties of White Cast Iron		
		11-07-2019	
26	Malleable Cast Iron		
		12-07-2019	
27	Grey Cast Iron, Spheriodal Graphite Cast Iron		
	Aller Cod I	13-07-2019	
28	Alloy Cast Irons. Classification of Steels		
		17-07-2019	Lecture
29	Structure And Properties of Plain Carbon Steels		interspersed
		19-07-2019	with
30	Low Alloy Steels, Hadfield Manganese Steels		discussions
	20 William Steels, Hadrield Wallgallese Steels	20.07.2010	
31	Tool and Die Steels	20-07-2019	
	Tool and Die ottois	22-07-2019	

## UNIT-IV Heat treatment of Alloys

CO4: To study the affect of various alloying elements on iron-iron carbide system. To understand the various heat treatment and strengthening processes used in practical applications.

#### TB:

32	Effect of Alloying Elements on Fe-Fe3C System,		
		23-07-2019	
33	Annealing, Normalizing, Hardening		
		25-07-2019	
34	TTT Diagrams		
		26-07-2019	
35	Tempering , Hardenability		
•		27-07-2019	
36	Surface - Hardening Methods		
		29-07-2019	Lecture

37	Age Hardening Treatment	29-07-2019	interspersed
38	Cryogenic Treatment of Alloys	30-07-2019	discussions

## UNIT-V Non-ferrous Metals and Alloys

**CO5:** To study the properties and applications of widely used non-ferrous metals and alloys so as to use the suitable material for practical applications.

#### TB:

Structure and Properties of Copper and its Alloys		
	01-08-2019	
Aluminium and its Alloys		
	02-08-2019	
Titanium and its Alloys.	03-08-2019	
Structure and Properties of Copper and its Allovs		1
The state of the s	05-08-2019	T
Aluminium and its Alloys		Lecture
	09-08-2019	interspersed
Titanium and its Alloys.		with
	10-08-2019	discussions
Structure and Properties of Copper and its Alloys		
	13-08-2019	
Aluminium And Its Alloys		
	16-08-2019	
Titanium And Its Alloys.		
	17-09-2019	
	Aluminium and its Alloys  Titanium and its Alloys.  Structure and Properties of Copper and its Alloys  Aluminium and its Alloys  Titanium and its Alloys.  Structure and Properties of Copper and its Alloys  Aluminium And Its Alloys	Aluminium and its Alloys  Titanium and its Alloys.  Structure and Properties of Copper and its Alloys  Aluminium and its Alloys  O5-08-2019  Titanium and its Alloys  Titanium and its Alloys.  Structure and Properties of Copper and its Alloys  10-08-2019  Structure and Properties of Copper and its Alloys  13-08-2019  Aluminium And Its Alloys  Titanium And Its Alloys.

#### UNIT-VI Ceramic and composite materials

CO6: To study the properties and applications of ceramic, composite and other advanced materials so as to use the suitable material for practical applications.

#### TB:

IR:			
48	Crystalline Ceramics, Glasses	19-08-2019	
49	Cermaets, Abrasive Materials	31-08-2019	
50	Nanomaterials – Definition	03-09-2019	
51	Properties And Applications Of The Above	04-09-2019	Lecture interspersed
52	Classification Of Composites	04-9-2019	with discussions
53	Various Methods Of Component Manufacture Of Composites	12-09-2019	
54	Particle – Reinforced Materials	13-09-2019	
55	Fiber Reinforced Materials	16-09-2019	

56	Metal Ceramic Mixtures	
		17-09-2019
57	Metal – Matrix Composites	
		24-09-2019
58	C – C Composites	
		25-09-2019
59	Classification of Composites	
	W. W. M. J. CO.	26-09-2019
60	Various Methods Of Component Manufacture of Composites	27-09-2019
61	Revision of unit-I	
		27-09-2019
62	Revision of unit-II	
		28-09-2019
63	Revision of unit-1II	
		28-09-2019
64	Revision of unit-1V	
	D ii a i i	01-09-2019
65	Revision of unit-V	
		01-10-2019

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Signature of HOD

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# TENTATIVE LESSON PLAN: R1621031 METALLURGY & MATERIALS SCIENCE

Course Titles M	D	ELECT & MATERIALS	CIENCE			
Section : Sec	ETALLU B	RGY & MATERIALS SCIENCE  Date: 10/06/2019	D N.	01 004		
The state of the s	Revision No : 00 Prepared By : D.ROGNATHA RAO			: 01 of 04		
Tools: Black board, PPTs    Revision No : 00   Prepared By : D.ROGNATHA RAO   Approved By :						
No. of Periods TOPIC Date Mod						
UNIT-I Stru	cture of	Metals and Constitution of alloys		Delivery		
CO1: To know	v the b	asic concepts of bonds in metals and allocation of solid solutions and other compounds.	oys. To unders	tand the basic		
1	Bonds	in Solids	11-06-2019			
2	Metall	ic Bond	12-06-2019			
3	Crysta	Ilization of Metals	13-06-2019			
4	Grain	and Grain Boundaries	14-06-2019			
5		of Grain Boundaries on the Properties of / Alloys	15-06-2019	Lecture interspersed		
6	Detern	nination of Grain Size	17-06-2019	with discussions		
7	Necess	sity of Alloying	18-06-2019			
8	Types	of Solid Solutions	19-06-2019			
9	Hume	Rotherys Rules	20-06-2019			
10	Interm Compo	ediate Alloy Phases, And Electron ounds	21-06-2019			
	and the	um Diagrams regions of stability of the phases that can occur regions metallurgy.	r in an alloy syst	em in order to		
11	Experi Equilib	mental Methods of Construction of orium Diagrams	22-06-2019			
12	Isomor	phous Alloy Systems	24-06-2019			
13	Equilib	orium Cooling and Heating of Alloys	25-06-2019			
14	Lever 1	Rule, Coring Miscibility Gaps	26-06-2019			
15	Eutecti	c Systems	27-06-2019			

16	Congruent Melting Intermediate Phases	28-06-2019	Lecture
17	Peritectic Reaction	28-00-2019	interspersed
		29-06-2019	with discussions
18	Transformations In The Solid State		discussions
10		02-07-2019	
19	Allotropy, Eutectoid, Peritectoid Reactions		
		03-07-2019	
20	Phase Rule		
		04-07-2019	
21	Relationship Between Equilibrium Diagrams And		
	Properties Of Alloys	05-07-2019	
22	Study Of Important Binary Phase Diagrams Of Cu-		
	Ni	06-07-2019	
23	Study Of Important Binary Phase Diagrams Of Al-		
	Cu, Bi-Cd, Ĉu-An	08-07-2019	
24	Study Of Important Binary Phase Diagrams Of		
	Cus-Sn And Fe-Fe3C	09-07-2019	
	Cus-Sii Aliu Fe-Fe3C	09-07-2019	

## **UNIT-III** Cast Irons and Steels

CO3: To study the basic differences between cast irons and steels, their properties and practical applications.

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П	N	D	

ID.			
25	Structure And Properties Of White Cast Iron		
		10-07-2019	
26	Malleable Cast Iron		
		11-07-2019	
27	Grey Cast Iron, Spheriodal Graphite Cast Iron		
		12-07-2019	
28	Alloy Cast Irons. Classification Of Steels		
		15-07-2019	Lecture
29	Structure And Properties Of Plain Carbon Steels		interspersed
		16-07-2019	with
			discussions
30	Low Alloy Steels, Hadfield Manganese Steels		-
		17-07-2019	
31	Tool And Die Steels		
		18-07-2019	

#### UNIT-IV Heat treatment of Alloys

CO4: To study the affect of various alloying elements on iron-iron carbide system. To understand the various heat treatment and strengthening processes used in practical applications.

TB:

32	Effect of Alloying Elements on Fe-Fe3C System,	
		19-07-2019
33	Annealing, Normalizing, Hardening	
		20-07-2019
34	TTT Diagrams	
		22-07-2019
35	Tempering , Hardenability	
		23-07-2019

36	Surface - Hardening Methods		
		24-07-2019	Lecture
37	Age Hardening Treatment	25-07-2019	interspersed
38	Cryogenic Treatment Of Alloys		with discussions
-00/ 10000		26-07-2019	uiscussions

## UNIT-V Non-ferrous Metals and Alloys

CO5: To study the properties and applications of widely used non-ferrous metals and alloys so as to use the suitable material for practical applications.

#### TB:

39	Structure and properties of copper and its alloys		
		27-07-2019	
40	Aluminium and its alloys		
		29-07-2019	
41	Titanium and its alloys.		
		30-07-2019	
42	Structure and properties of copper and its alloys		
	· · · · · · · · · · · · · · · · · · ·	31-07-2019	
43	Aluminium and its alloys		Lecture
		01-08-2019	interspersed
44	Titanium and its alloys.		with
		02-08-2019	discussions
45	Structure and properties of copper and its alloys		
		03-08-2019	
46	Aluminium and its alloys		
		05-08-2019	
47	Titanium and its alloys.		
TINITE XII		06-09-2019	

## UNIT-VI Ceramic and composite materials

CO6: To study the properties and applications of ceramic, composite and other advanced materials so as to use the suitable material for practical applications.

#### TB:

48	Crystalline Ceramics, Glasses		
		07-08-2019	
49	Cermaets, Abrasive Materials	08-08-2019	
50	Nanomaterials – Definition		
		09-08-2019	Lecture
51	Properties And Applications Of The Above		interspersed
		13-08-2019	with
52	Classification Of Composites	The relies of the second	discussions
		14-08-2019	
53	Various Methods Of Component Manufacture Of Composites	16-08-2019	
54	Particle – Reinforced Materials		
		17-08-2019	

55	Fiber Reinforced Materials		
		22-08-2019	
56	Metal Ceramic Mixtures		
		26-08-2019	
57	Metal – Matrix Composites And		
	•	29-08-2019	
58	C – C Composites		
		04-09-2019	
59	Classification Of Composites		
	T	06-09-2019	
60	Various Methods Of Component Manufacture Of		
	Composites	13-09-2019	
		15-07-2017	
61	Revision of unit-I		
		17-09-2019	
62	Revision of unit-II		*
02	Revision of unit-11	24 10 2010	
	7 11 0 117	24-10-2019	
63	Revision of unit-1II		
		27-09-2019	
64	Revision of unit-1V		
		28-09-2019	
65	Revision of unit-V		
		01-10-2019	

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Course Title: ME	CHANICS OF SOLIDS (R1621032)	
Section : A	Date: 10-06-2019	<b>Page No:</b> 01 of 03
Revision No: 00	Prepared By: Z. Jitendra	Approved By: HOD

Tools: Black board, PPTs

No. of	TOPIC	Date	Mode of Delivery
Periods			

#### UNIT -I SIMPLE STRESS AND STRAINS

CO1: Student will know the basic terms like stress, strain poissons ratio etc and stresses in bars of varying cross sections, composite bars, thermal stress in members, stresses on inclined planes with analytical approach and graphical approach, strain energy under different loadings and alsoproblem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

1	SIMPLE STRESSES &STRAINS:	17/6/2019	7
2	Types of stresses and strains	18/6/2019	
3.	Hooke's law – stress – strain diagram for mild steel	19/6/2019	
4.	Lateral strain, Poisson's ratio & volumetric strain	24/6/2019	
5.	Bars of varying section	25/6/2019	
6.	composite bars	26/6/2019	Lecture interspersed
7.	Temperature stresses- Complex Stresses	27/6/2019	with discussions
8.	Problems	29/6/2019	
9.	Stresses on an inclined plane under different uniaxial and biaxial stress conditions	1/7/2019	
10.	Principal planes and principal stresses	2/7/2019	
11.	Mohr's circle	4/7/2019	
12.	Relation between elastic constants	5/7/2019	
13.	Strain energy, Gradual, sudden	8/7/2019	
14.	impact and shock loadings	10/7/2019	

#### UNIT -II SHEAR FORCE AND BENDING MOMENT

CO2: Able to perform to construction of shear force diagrams and bending moment diagrams to the different loads for the different support arrangements and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

15	SHEAR FORCE AND BENDING MOMENT	15/7/2019	
16	Definition of beam, Types of beams, Concept of shear force and bending moment	15/7/2019	Lecture interspersed with discussions
17	S.F and B.M diagrams for cantilever	18/7/2019	With discussions
18	S.F and B.M diagrams for simply supported	19/7/2019	

Course Title: MECHANICS OF SOLIDS (R1621032)

Section: A Date: 10-06-2019 Page No: 02 of 03

Revision No: 00 Prepared By: Z. Jitendra Approved By: HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
19.	problems	20/7/2019	
20.	Point of contra flexure	22/7/2019	Lecture interspersed with discussions
21.	Relation between S.F., B.M and rate of loading at a section of a beam	22/7/2019	
22.	problems	24/7/2019	
23.	problems	25/7/2019	
24.	problems	26/7/2019	

## UNIT - III FLEXURAL STRESSES AND SHEAR STRESSES

CO3: Student can perform the bending and shear stress induced in the beams which are made with different cross sections like rectangular, circular, triangular, I, T angle sections and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

25.	FLEXURAL STRESSES	27/7/2019	
26.	Theory of simple bending – Assumptions	29/7/2019	
27.	Derivation of bending equation: $M/I = f/y = E/R$	31/7/2019	
28.	Determination bending stresses	1/8/2019	
29.	rectangular and circular sections	2/8/2019	Lecture interspersed
30.	I,T, Angle and Channel sections	3/8/2019	with discussions
31.	Derivation of Shear stress.	5/8/2019	
32.	Rectangular, triangular sections	7/8/2019	
33.	I, T sections	8/8/2019	
34.	Problems	16/7/2019	
35.	Problems	17/7/2019	

## UNIT - V THIN CYLINDERS AND THICK CYLINDERS

CO5: Student will know how a cylinder fails, what kind of stresses induced in cylinders subjected to internal, external pressures and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

36.	CYLINDERS	28/8/2019	
37.	Thin seamless cylindrical shells	29/8/2019	
	Derivation of formula for longitudinal and	31/8/2019	
38.	circumferential stresses		
39.	hoop, longitudinal and Volumetric strains	4/9/2019	
40.	changes in dia, and volume of thin cylinders	5/9/2019	Lecture interspersed
41.	Problems	6/9/2019	with discussions
42.	Problems	7/9/2019	
43.	Problems	9/9/2019	
44.	Riveted boiler shells	11/9/2019	
45.	Thin spherical shells	12/9/2019	
46.	Problems	13/9/2019	

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THE RESERVE OF THE PARTY OF THE	CHANICS OF SOLIDS (R1621032)  Date: 10-06-2019	Page No: 03 of 03	
Section: A Date: 10-06-2019  Revision No: 00 Prepared By: Z. Jitendra		Approved By : HOD	
Revision 140.00	Trepared By: 2: stemare		

Tools:	Black	board,	<b>PPTs</b>

No. of	TOPIC	Date	Mode of Delivery
Periods		13/9/2019	
47.	Problems		-
48.	lame's equation	16/9/2019	
49.	cylinders subjected to inside	16/9/2019	Lecture interspersed
50.	outside pressures	17/9/2019	with discussions
51.	compound cylinders	17/9/2019	
52.	Problems	18/9/2019	

# UNIT - VI TORSION AND COLUMNS

CO6: Student can perform shear stresses induced in circular shafts, discussing columns in stability point of view and columns with different end conditions.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

I RELIGITION TO THE PARTY OF TH	19/0/2010	
TORSION AND COLUMNS		
Torsion of Circular shafts		
	20/9/2019	
	20/9/2019	Lecture interspersed
	23/9/2019	with discussions
	23/9/2019	
	24/9/2019	
Rankin's Formula		
Limitations of Euler's Formula		
Problems	26/9/2019	
	TORSION AND COLUMNS  Torsion of Circular shafts  Problems  Problems  Shafts in series, Shafts in parallel.  Problems  Columns with Pinned ends  Columns with other support Conditions  Rankin's Formula  Limitations of Euler's Formula  Problems	TORSION AND COLUMNS       18/9/2019         Torsion of Circular shafts       19/9/2019         Problems       20/9/2019         Problems       20/9/2019         Shafts in series, Shafts in parallel.       20/9/2019         Problems       23/9/2019         Columns with Pinned ends       23/9/2019         Columns with other support Conditions       24/9/2019         Rankin's Formula       25/9/2019         Limitations of Euler's Formula       25/9/2019         Problems       26/9/2019

# UNIT - IV DEFLECTION OF BEAMS

CO4: Able to finding slope and deflection for different support arrangements by Double integration method, Macaulay's method and Moment-Area and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

<b>TB:</b> "S	TRENGTH OF MATERIALS DITIES	26/9/2019	
65.	DEFLECTION OF BEAMS	27/9/2019	
66.	Bending into a circular arc		
67.	methods Determination of slope and deflection	27/9/2019	Lecture interspersed
68.	Simply supports, point loads	28/9/2019	with discussions
	UDL, Mohr's	28/9/2019	
69.		30/9/2019	
70.	Problems	1/10/2019	-
71.	Problems		
72.	Revision	2/10/2019	
12.	TC / 12/C	$\wedge$	

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Course Title: MECHANICS OF SOLIDS (R1621032)				
Section : B	Date: 10-06-2019	<b>Page No:</b> 01 of 03		
Revision No: 00	Prepared By: Z. Jitendra	Approved By : HOD		

Tools: Black board, PPTs

No. of	TOPIC	Date	Mode of Delivery
Periods			

#### UNIT -I SIMPLE STRESS AND STRAINS

CO1: Student will know the basic terms like stress, strain poissons ratio etc and stresses in bars of varying cross sections, composite bars, thermal stress in members, stresses on inclined planes with analytical approach and graphical approach, strain energy under different loadings and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

1	SIMPLE STRESSES &STRAINS:	17/6/2019	
2	Types of stresses and strains	18/6/2019	
3.	Hooke's law – stress – strain diagram for mild steel	19/6/2019	
4.	Lateral strain, Poisson's ratio & volumetric strain	24/6/2019	
5.	Bars of varying section	25/6/2019	
6.	composite bars	26/6/2019	Lecture interspersed
7.	Temperature stresses- Complex Stresses	27/6/2019	with discussions
8.	Problems	29/6/2019	
9.	Stresses on an inclined plane under different uniaxial and biaxial stress conditions	1/7/2019	
10.	Principal planes and principal stresses	2/7/2019	
11.	Mohr's circle	4/7/2019	
12.	Relation between elastic constants	5/7/2019	
13.	Strain energy, Gradual, sudden	8/7/2019	
14.	impact and shock loadings	10/7/2019	

## UNIT -II SHEAR FORCE AND BENDING MOMENT

CO2: Able to perform to construction of shear force diagrams and bending moment diagrams to the different loads for the different support arrangements and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

15	SHEAR FORCE AND BENDING MOMENT	15/7/2019	
16	Definition of beam, Types of beams, Concept of shear force and bending moment	15/7/2019	Lecture interspersed with discussions
17	S.F and B.M diagrams for cantilever	18/7/2019	With discussions
18	S.F and B.M diagrams for simply supported	19/7/2019	

Course Title: MECHANICS OF SOLIDS (R1621032)				
Section : B Date : 10-06-2019 Page No : 02 of 03				
<b>Revision No</b> : 00	Prepared By : Z. Jitendra	Approved By: HOD		

Tools	•	Bla	ck	board.	PPTs
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No. of Periods	TOPIC	Date	Mode of Delivery
19.	problems	20/7/2019	
20.	Point of contra flexure	22/7/2019	
21.	Relation between S.F., B.M and rate of loading at a section of a beam	22/7/2019	Lecture interspersed with discussions
22.	problems	24/7/2019	with discussions
23.	problems	25/7/2019	
24.	problems	26/7/2019	

#### UNIT - III FLEXURAL STRESSES AND SHEAR STRESSES

**CO3**: Student can perform the bending and shear stress induced in the beams which are made with different cross sections like rectangular, circular, triangular, I, T angle sections and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

25.	FLEXURAL STRESSES	27/7/2019	
26.	Theory of simple bending – Assumptions	29/7/2019	
27.	Derivation of bending equation: $M/I = f/y = E/R$	31/7/2019	
28.	Determination bending stresses	1/8/2019	
29.	rectangular and circular sections	2/8/2019	Lecture interspersed
30.	I,T, Angle and Channel sections	3/8/2019	with discussions
31.	Derivation of Shear stress.	5/8/2019	
32.	Rectangular, triangular sections	7/8/2019	
33.	I, T sections	8/8/2019	
34.	Problems	16/7/2019	
35.	Problems	17/7/2019	

#### UNIT - V THIN CYLINDERS AND THICK CYLINDERS

CO5: Student will know how a cylinder fails, what kind of stresses induced in cylinders subjected to internal, external pressures and also problem solving techniques.

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36.	CYLINDERS	28/8/2019	
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38.	Derivation of formula for longitudinal and	31/8/2019	
38.	circumferential stresses		
39.	hoop, longitudinal and Volumetric strains	4/9/2019	
40.	changes in dia, and volume of thin cylinders	5/9/2019	Lecture interspersed
41.	Problems	6/9/2019	with discussions
42.	Problems	7/9/2019	
43.	Problems	9/9/2019	
44.	Riveted boiler shells	11/9/2019	
45.	Thin spherical shells	12/9/2019	
46.	Problems	13/9/2019	

Course Title: MECHANICS OF SOLIDS (R1621032)		
Section : B	Date: 10-06-2019	<b>Page No:</b> 03 of 03
Revision No: 00	Prepared By: Z. Jitendra	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
47.	Problems	13/9/2019	
48.	lame's equation	16/9/2019	
49.	cylinders subjected to inside	16/9/2019	Lecture interspersed
50.	outside pressures	17/9/2019	with discussions
51.	compound cylinders	17/9/2019	
52.	Problems	18/9/2019	

#### UNIT - VI TORSION AND COLUMNS

CO6: Student can perform shear stresses induced in circular shafts, discussing columns in stability point of view and columns with different end conditions.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

53.	TORSION AND COLUMNS	18/9/2019	
54.	Torsion of Circular shafts	19/9/2019	
55.	Problems	19/9/2019	
56.	Problems	20/9/2019	
57.	Shafts in series, Shafts in parallel.	20/9/2019	Lecture interspersed
58.	Problems	23/9/2019	with discussions
59.	Columns with Pinned ends	23/9/2019	
60.	Columns with other support Conditions	24/9/2019	
61.	Rankin's Formula	24/9/2019	
62.	Limitations of Euler's Formula	25/9/2019	
63.	Problems	25/9/2019	
64.	Problems	26/9/2019	

#### UNIT – IV DEFLECTION OF BEAMS

**CO4**: Able to finding slope and deflection for different support arrangements by Double integration method, Macaulay's method and Moment-Area and also problem solving techniques.

TB: "STRENGTH OF MATERIALS" Dr. R. K. BANSAL, 4th Edition, LAXMI PUBLICATIONS.

ID. S.	RENGIN OF WHITEIGHES BILLINGS BILLING	, , ,	
65.	DEFLECTION OF BEAMS	26/9/2019	
66.	Bending into a circular arc	27/9/2019	
67.	methods Determination of slope and deflection	27/9/2019	I active interespond
68.	Simply supports, point loads	28/9/2019	Lecture interspersed with discussions
69.	UDL, Mohr's	28/9/2019	with discussions
70.	Problems	30/9/2019	
71.	Problems	1/10/2019	
72.	Revision	2/10/2019	

Signature of the Faculty

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Signature of the HOD

SRK Institute of Technology ENIKEPADU, VIJAYAWADA-521 108

Course Title: Tl	HERMODYNAMICS	Cou	rse code: F	
Section : Sec A	Date:10/6/2019		Page No:	
Revision No: 00	Prepared By: D. SREERAMPRASAD		Approved	By: HOD
Tools: BLACK	BOARD,PPT			Mode of
No. of Periods	TOPIC		Date	Delivery
UNIT-IBASIC	CONCEPTS			
CO1:The stude	nt will able to study the concept of various thermo	dyna	mic cycles	and working
of aristoms				
TB: "THERM	ODYNAMICS, by P.K.NAG 3 <sup>rd</sup> Edition, Tata	Mc	Graw Hill	Education
Private Limited	publications.	1.4	0/6/2019	
1	What is Thermodynamics	1	0/6/2019	
2	Macroscopic and Macroscopic approach	13	2/6/2019	
3	Types of systems	1:	2/6/2019	
4	Property and types of properties	1	3/6/2019	
5	Process quasistatic process	1	5/6/2019	
6	Reversible and irreversible process	1	5/6/2019	
7	Pressure and temperature measurement	1	5/6/2019	Lecture
	Problems on pressure and temperature	1	9/6/2019	intersperse
8	measurement			with
9	Work and heat		9/6/2019	discussions
10	Work and heat in different process		9/6/2019	
11	Zeroth law of thermodynamics		0/6/2019	
12	Principle of thermometry		2/6/2019	
13	Scale of temperature ,ideal gas scale-PMM1		2/6/2019	
14	Pressure measurement	2	22/6/2019	
15	Problems on temperature measurement	2	24/6/2019	
16	Problems on pressure measurement	2	26/6/2019	
	st law of thermodynamics			
COS To the	the concents of first law of thermodynamics.			
TB:". THERN	MODYNAMICS, by P.K.NAG 3 <sup>rd</sup> Edition, Tat	a M	cGraw Hi	Il Educatio
Private Limite	d publications			
	Law of conservation of energy concept, first	2	26/6/2019	_
17	law of thermodynamics			Lecture
10	First law applied to different thermodynamic	1	27/6/2019	intersperse
18	process		20/6/2010	with
19	Concept of equality of temperature		29/6/2019	discussion
20	Joule's experiment		03/7/2019	
21	Steady flow energy equation applied to		03/7/2019	
	boiler, heat exchanger, reciprocating pump		03/7/2019	
22	Steady flow energy equation		03/1/2019	

23	Steady flow energy equation applied to turbine,gas turbine, compressor	06/7/2019	and the second s
24	Steady flow energy equation applied to	06/7/2019	
24	boiler, heat exchanger, reciprocating pump		
25	Throttling and free expansion	06/7/2019	
26	Vander waal's equation of state	10/7/2019	
27	Variable specific heat and problems	10/7/2019	
28	problems	10/7/2019	
29	Problems	17/7/2019	

#### UNIT-III CO3: second law of thermodynamics

TB1: "THERMODYNAMICS, by P.K.NAG 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private Limited publications.

Fivate Limite	a publications.		
30	Limitations of first law-Thermal	20/7/2019	
	reservoir,heatengine,heat pump		
	Second law of thermodynamics-Kelvin-	24/7/2019	
31	plank and clausius statements and their		
	equivalence		
	PMM of second kind, carnot's principle and	25/7/2019	
32	it's specialties		
	Thermodynamics scale of temperature,	27/7/2019	
33	clausius inequality		Lastura
33			Lecture interspersed
34	Entropy and principle of entropy	27/7/2019	with
35	Availability and irreversibility	27/7/2019	discussions
26	Thermodynamic potential, Gibbs and	01/7/2019	
36	Helmholtz functions		
37	Maxwell relations	01/7/2019	
20	Elementary treatment of the third of	01/7/2019	
38	thermodynamics		
39	problems	03/7/2019	
40	problems	03/8/2019	

## **UNIT-4properties of steam**

Co4.To study and understand the process steam formation and its representation on property diagram

## B: "THERMODYNAMICS" by P.K.NAG 3rd Edition, Tata McGraw Hill Education Private Limited publications

41	Pure substances, P-V-T surfaces	21/8/2019	Lecture interspersed
42	T-S,h-s diagrams ,mollier chart	21/8/2019	with
43	Phase transformation-triple point at critical	22/8/2019	discussions

eno historio erakka akasan ak 1972 ah Garaga ka kepakaska ka ka ka 1978 ki	state propreties		the state of the state of
44	Dryness fraction	28/8/2019	
45	Clausius-clapeyron equation proprety tables- mollier chart-various Thermodynamics process	28/8/2019	
46	Steam calorimetry	28/8/2019	

#### UNIT-V Gas mixtures and psychrometry

CO5: To understand and able to use psychometric chart and calculate psychometric properties of air

TB: THERMODYNAMICS, by P.K.NAG 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private

Limited pu	blications		
47	Mixture of perfect gases -mole fraction,massfraction,gravimetric and volumetric analysis	31/8/2019	
48	Dalton's law of partial pressures-Avogadro's law of additive volumes-mole fraction, volume fraction and pratial pressure	04/9/2019	Lecture interspersed
49	Internal energy, enthalpy, sp. Heats and entropy of perfect gases and vapor	04/9/2019	with discussions
50	Psychrometryproperties -driven temperature, wet bulb temperature, duepoint temperature	05/9/2019	and the second
51	Specific humidity, relative humidity, saturated air and vapor pressure	05/9/2019	
52	Degree of saturation-adiabatic saturation		The second second
53	Carrier's equation- psychrometry charts		
54			

#### UNIT-VI power cycles

CO6:. To understand the concepts of air standard cycles and should be able to calculate the efficiency and the performance parameters of system that use this cycles

TB: "THERMODYNAMICS, by P.K.NAG 3<sup>rd</sup>Edition, Tata McGraw Hill Education

Private Limited publications

I IIvate Limit	cu publications		
55	Otto and Diesel cycles	12/9/2019	
56	Dual combustion cycle, Sterling cycle	12/9/2019	
57	Erickson cycle and Lenoir cycle	18/9/2019	
58	Comparison of cycles	18/9/2019	Lecture
59	Refrigeration cycles -Brayton cycle and	21/9/2019	interspersed
	Rankine cycle and performance evaluation		with
60	Bell-Coleman cycle	21/9/2019	discussions
61	Vapor compression cycle, performance	01/10/2019	
	evaluation		
62	Problems	02/10/2019	
	11	./\ / //	

Signature of HOD

Date:

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**SRK Institute of Technology** ENIXEPADU, VIJAYAWADA-521 108

Course Title: TF	IERMODYNAMICS	Course code: I	01 + 02
Section : Sec B	Date: 10/6/2019	Page No:	01 to 03
Revision No : 00	Prepared By: D. SREERAMPRASAD	Approved	By: HOD
Tools: BLACK	BOARD,PPT		Mode of
No. of Periods	TOPIC	Date	Delivery
UNIT-IBASIC	CONCEPTS		1
CO1:The stude	nt will able to study the concept of various thermod	dynamic cycles	and working
TB: "THERM	ODYNAMICS, by P.K.NAG 3 <sup>rd</sup> Edition, Tata	McGraw Hil	Luucation
Private Limited	publications.	10/6/2019	
1	What is Thermodynamics	10/6/2019	
	Macroscopic and Macroscopic approach	12/6/2019	
3	Types of systems	12/6/2019	
4	Property and types of properties	13/6/2019	
5	Process quasistatic process	15/6/2019	
6	Reversible and irreversible process	15/6/2019	
7	Pressure and temperature measurement	15/6/2019	Lecture
	Problems on pressure and temperature	19/6/2019	interspersed
8	measurement		with
9	Work and heat	19/6/2019	discussions
10	Work and heat in different process	19/6/2019	
11	Zeroth law of thermodynamics	20/6/2019	
12	Principle of thermometry	22/6/2019	
13	Scale of temperature, ideal gas scale-PMM1	22/6/2019	
14	Pressure measurement	22/6/2019	
	Problems on temperature measurement	24/6/2019	
15	Problems on pressure measurement	26/6/2019	
16	st law of thermodynamics		
	0.00 1 01 dvinomico		
TD." THED	the concepts of first law of thermodynamics.  MODYNAMICS, by P.K.NAG 3 <sup>rd</sup> Edition, Tat	a McGraw H	ill Education
Drivete Limite	ed publications		
Private Limite	Law of conservation of energy concept, first	26/6/2019	
17	law of thermodynamics		Lecture
	First law applied to different thermodynamic	27/6/2019	
18	process		with
19	Concept of equality of temperature	29/6/2019	
20	Joule's experiment	03/7/2019	and the second s
	Steady flow energy equation applied to	03/7/2019	
21	boiler, heat exchanger, reciprocating pump	00/2/2010	
22	Steady flow energy equation	03/7/2019	

23	Steady flow energy equation applied to turbine, gas turbine, compressor	06/7/2019	Martin Committee
24	Steady flow energy equation applied to boiler, heat exchanger, reciprocating pump	06/7/2019	
25	Throttling and free expansion	06/7/2019	
26	Vander waal's equation of state	10/7/2019	
27	Variable specific heat and problems	10/7/2019	
28	problems	10/7/2019	
29	Problems	17/7/2019	

#### UNIT-III: SECOND LAW OF THERMODYNAMICS CO3:

TB1: "THERMODYNAMICS, by P.K.NAG 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private Limited publications.

rivate Limit	ted publications.		
30	Limitations of first law-Thermal	20/7/2019	
30	reservoir, heatengine, heat pump		
	Second law of thermodynamics-Kelvin-	24/7/2019	
31	plank and clausius statements and their		
	equivalence		
	PMM of second kind, carnot's principle and	25/7/2019	
32	it's specialties		
	Thermodynamics scale of temperature,	27/7/2019	
33	clausius inequality		Lecture
33			interspersed
34	Entropy and principle of entropy	27/7/2019	with
35	Availability and irreversibility	27/7/2019	discussions
	Thermodynamic potential ,Gibbs and	01/7/2019	
36	Helmholtz functions		
37	Maxwell relations	01/7/2019	
	Elementary treatment of the third of	01/7/2019	
38	thermodynamics		
39	problems	03/7/2019	
40	problems	03/8/2019	

# UNIT- 4 PROPERTIES OF STEAM

Co4.To study and understand the process steam formation and its representation on property diagram

## B:", THERMODYNAMICS, by P.K.NAG 3rd Edition, Tata McGraw Hill Education Private Limited publications

41	Pure substances, P-V-T surfaces	21/8/2019	Lecture interspersed
42	T-S,h-s diagrams ,mollier chart	21/8/2019	with

// 4	Phase transformation-triple point at critical state propreties	22/8/2019	discussions
44	Dryness fraction	28/8/2019	
45	Clausius-clapeyron equation proprety tables- mollier chart-various Thermodynamics process	28/8/2019	
46	Steam calorimetry	28/8/2019	

#### UNIT-V GAS MIXTURES AND PSYCHROMETRY

CO5: To understand and able to use psychometric chart and calculate psychometric properties

TB: THERMODYNAMICS, by P.K.NAG 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private

I imited publications

47	Mixture of perfect gases -mole	31/8/2019	
٦/	fraction,massfraction,gravimetric and volumetric analysis		
48	Dalton's law of partial pressures-Avogadro's	04/9/2019	
	law of additive volumes-mole fraction, volume		Lecture
	fraction and pratial pressure		interspersed
49	Internal energy, enthalpy,sp. Heats and	04/9/2019	with
	entropy of perfect gases and vapor		discussions
50	Psychrometryproperties -driven temperature,	05/9/2019	
	wet bulb temperature, duepoint temperature		
51	Specific humidity, relative humidity, saturated	05/9/2019	
	air and vapor pressure	03/3/2013	
52	Degree of saturation-adiabatic saturation		
53	Carrier's equation- psychrometry charts		
54			

#### **UNIT-VI POWER CYCLES**

CO6:. To understand the concepts of air standard cycles and should be able to calculate the efficiency and the performance parameters of system that use this cycles

TB: "THERMODYNAMICS, by P.K.NAG 3<sup>rd</sup>Edition, Tata McGraw Hill Education

Private Limited publications

Private Limit	eu publications		
55	Otto and Diesel cycles	12/9/2019	
56	Dual combustion cycle, Sterling cycle	12/9/2019	
57	Ericcson cycle and Lenoir cycle	18/9/2019	
58	Comparison of cycles	18/9/2019	Lecture
59	Refrigeration cycles -brayton cycle and	21/9/2019	interspersed
	rankine cycle and performance evaluation		with
60	Bell-coleman cycle	21/9/2019	discussions
61	Vapour compression cycle, performance	01/10/2019	
	evaluation		
62	Problems	01/10/2019	

Signature of

Date:

PRINCIPAL

**SRK** Institute of Technology ENIKEPADU, VIJAYAWADA-521 108

# TENTATIVE LESSON PLAN: RT22034 FLUID MECHANICS AND HYDRAULIC MACHINES

Section : Sec	FLUID MECHANICS AND HYDRAULIC MAC		
Revision No :	2012012013	Page No: 01 of 04	
	Tropared by . M. CHAHAMA	Approv	ed By: HOD
Tools: Black No. of Period			
No. of Period	TOPIC	Date	Mode of
IINIT I ELL	ID STATICS		Delivery
con: Compre	hend different concepts of fluid and its properties,	manometry, hyd	rostatic force
acting on unite	rent surfaces and also problem solving techniques.		
TB: Fluid med	hanics and Hydraulic machines-Dr.R.K.Bansal		
1	Introduction: physical properties of fluids-	11-06-2019	
	density, specific weight, specific gravity, specific		
	volume		
2	viscosity and its significance	12-06-2019	
3	surface tension	13-06-2019	
4	Capillarity-capillary rise, capillary fall	14-06-2019	
5	Measurement of pressure-vapor pressure,	15-06-2019	
	Atmospheric gauge and vacuum pressure		Lecture
6	Manometers- Piezometer, U-tube	18-06-2019	interspersed
7	Inverted and differential manometers.	19-06-2019	with
8	Pascal's law, hydrostatic law.	20-06-2019	discussions
9	Buoyancy and floatation- Meta center, meta-	21-06-2019	
	centric height		
10	Determination of met centric height	22-06-2019	
11	Stability of floating body. Submerged bodies	24-06-2019	
12	Stability analysis and applications.	25-06-2019	
UNIT-II	FLUID KINEMATICS, FLUID DYNAMICS		
CO2: Understa	nd the topics of basic laws of fluids, flow patterns, v	iscous flow thro	ugh ducts
and their corres	ponding problems.		mg
TR: Fluid maa	haniss and Hala III II II II II II II		
13	hanics and Hydraulic machines-Dr.R.K.Bansal		
14	Introduction, flow types	26-06-2019	
14	Stream line, path line and streak lines and stream tube.	27-06-2019	
15			
13	Equation of continuity for one Dimensional flow.	20 06 2010	
16	Stream function and velocity potential function,	28-06-2019	
10	differences and relation between them	20.06.2010	Lecture
17	Condition for irrotational flow	29-06-2019	interspersed
	I I I I I I I I I I I I I I I I I I	01-07-2019	with

18	circulation and vorticity		discussions
		02-07-2019	discussions
19	flow net, source and sink,		
		04-07-2019	
20	doublet and vortex flow		
		05-07-2019	
20	surface and body forces –Euler's equation		
	Bernoulli's equation for flow along a stream line	06-07-2019	
21	Applications of Bernoulli's equation		
		08-07-2019	
22	Momentum equation and its applications-force on pipe bend.	09-07-2019	
23	Closed conduit flow: Reynolds experiment-	11-07-2019	
24	Darcy Weisbach equation	11 07 2015	
		12-07-2019	
25	Minor losses in pipes-losses due to sudden		
	expansion, contraction, pipe bend, couplings e.t.c	13-07-2019	
26	pipes in series and pipes in parallel		
		17-07-2019	
27	Total energy line-,hydraulic gradient line.		
		19-07-2019	

# UNIT-III BOUNDARY LAYER THEORY, DIMENSIONAL ANALYSIS

**CO3:** Analyze dfferentconcepts related to boundary layer theory, flow separation, basic concepts of velocity profiles, dimensionless numbers and dimensional analysis.

TB: Fluid mechanics and Hydraulic machines-Dr.R.K.Bansal

28	Introduction: Boundary layer, Bondary layer		
	formation over flat plate	20-07-2019	
29	Displacement, momentum, energy thickness		
		22-07-2019	
30	momentum integral equation,		
		23-07-2019	
31	Separation of boundary layer, control of flow separation,	25-07-2019	Lecture
32	Stream lined body, Bluff body and its applications	26-07-2019	interspersed with
33	Basic concepts of velocity profiles.	20 07 2019	discussions
		27-07-2019	
34	Dimensionless numbers-reynold's ,weber,		
	froud's, mach numbers	29-07-2019	
UNIT-IV	BASICS OF TURBO MACHINERY		

#### UNIT-IV BASICS OF TURBO MACHINERY

CO4: Able to determine hydrodynamic forces on various types of vanes

B: Fluid mechanics and Hydraulic machines-Dr.R.K.Bansal

35	bridge dring and former C:	
33	hydrodynamic force of jets on stationary flat,	
	inclined, and curved vanes	29-07-2019
	memica, and curved valles	25-07-2015

2.6				
36	hydrodynamic force of jets on moving flat,	20 07 2010		
	inclined curved vanes	30-07-2019	Lecture	
37	Force of jet on moving curved vanes at centre, at	01 00 0010	intersperse	
20	tip and velocity diagram concept	01-08-2019	with	
38	Flow over radial vanes.	02-08-2019	discussions	
JNIT-V	CENTRIFUGAL PUMPS, RECIPROCATING PU			
	to understand the working of pumps and study their characteristics.			
	mechanics and Hydraulic machines-Dr.R.K.Bansal	acteristics		
39	Classification of pumps	03-08-2019		
40	working, work done of centrifugal pump	05 00 2015		
	S,	05-08-2019		
41	Heads of a pump-manometric head, suction head,			
	delivery head, static head	09-08-2019		
42	losses and efficiencies			
		10-08-2019		
43	specific speed-derivation	12 00 2010	Tastuus	
44		13-08-2019	Lecture	
44	pumps in series and parallel	16-08-2019	interspersed with	
45	cavitation & NPSH.	10-00-2017	discussions	
	out it is in the second of the	17-09-2019	discussions	
46	Reciprocating pumps classification and Working			
		19-08-2019		
47	Discharge, slip			
40		31-08-2019		
48	Indicator diagrams.	02 00 2010		
	HYDRAULIC TURBINES, PERFORMANCE OF HY	03-09-2019		

**CO6:** Able to design various components of turbines and study their characteristics and also evaluate the performance of turbines.

TB: Fluid mechanics and Hydraulic machines-Dr.R.K.Bansal

49	Classification of turbines		
		04-09-2019	
50	Impulse- Pelton wheel, working, work done, efficiency	04-9-2019	Lecture
51	Reaction turbine-Francis turbine, working, work done, efficiency	12-09-2019	interspersed with
52	Kaplan turbine-,working, work done, efficiency	13-09-2019	discussions
53	draft tube- theory	16-09-2019	
54	characteristic curves- main characterstic curves, operating, constant efficiency curves	17-09-2019	

55	governing of turbines, selection of type of turbine	
		24-09-2019
56	cavitation, surge tank, water hammer	
		25-09-2019
57	Hydraulic systems-hydraulic ram, hydraulic lift	
70		26-09-2019
58	hydraulic coupling, Fluidics – amplifiers	
50	Davids C. Int	27-09-2019
59	Revision of unit-I	
(0	Devision of the H	27-09-2019
60	Revision of unit-II	
61	Revision of unit-III	28-09-2019
61	Revision of unit-111	
62	Revision of unit-1V	28-09-2019
02	Revision of unit-1 v	01 00 0010
63	Revision of unit-V	01-09-2019
03	revision of unit-	01 10 2010
64	Revision of unit-I	01-10-2019
UT	ASSESSMENT WHITE-I	27 00 2010
		27-09-2019

M. U. Signature of Faculty

Signature of HOD
PRINCIPAL

SRK Institute of Technology ENIKEPADU, VIJAYAWADA-521 108

# TENTATIVE LESSON PLAN: RT22034 FLUID MECHANICS AND HYDRAULIC MACHINES

Section : Sec I	_ = = = = = = = = = = = = = = = = = = =		o: 01 of 04
Revision No: 00	The state of the s	Approved By : H	
Tools: Black bo	ard, PPTs		
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I FLUII			
CO1: Comprehe	end different concepts of fluid and its properties, m	anometry, hyd	drostatic force
acting on differen	nt surfaces and also problem solving techniques.		
ГВ: Fluid mecha	anics and Hydraulic machines-Dr.R.K.Bansal		
1	Introduction: physical properties of fluids-	11-06-2019	
	density, specific weight, specific gravity, specific		
	volume		
2	viscosity and its significance	12-06-2019	
3	surface tension	13-06-2019	
4	Capillarity-capillary rise, capillary fall	14-06-2019	
5	Measurement of pressure-vapor pressure,	15-06-2019	
	Atmospheric gauge and vacuum pressure		Lecture
6	Manometers- Piezometer, U-tube	17-06-2019	intersperse
7	Inverted and differential manometers.	18-06-2019	with
8	Pascal's law, hydrostatic law.	19-06-2019	discussion
9	Buoyancy and floatation- Meta center, meta-	20-06-2019	
	centric height		
10	Determination of met centric height	21-06-2019	
11	Stability of floating body. Submerged bodies	22-06-2019	
12	Stability analysis and applications.	24-06-2019	
CO2: Understand and their corresponding Fluid mechanics.	LUID KINEMATICS, FLUID DYNAMICS of the topics of basic laws of fluids, flow patterns, visonding problems.  Anics and Hydraulic machines-Dr.R.K.Bansal		ough ducts
13	Introduction, flow types	25-06-2019	
14	Stream line, path line and streak lines and stream	26-06-2019	
15	tube.		
15	Equation of continuity for one	27.06.2010	
16	Dimensional flow. Stream function and velocity potential function,	27-06-2019	
10	differences and relation between them	28-06-2019	Lecture
17	Condition for irrotational flow	20-00-2019	intersperse
	Condition for inforational flow	29-06-2019	with
		29-00-7019	discussion

		00 05 0010	ı
19	flow net, source and sink,	02-07-2019	
19	now net, source and sink,		
		03-07-2019	
20	doublet and vortex flow		
		04-07-2019	
20	surface and body forces -Euler's equation	0.072019	
	Bernoulli's equation for flow along a stream line	05-07-2019	
21	Applications of Description	03-07-2019	57 H4 276
21	Applications of Bernoulli's equation		
22	Monage	06-07-2019	
22	Momentum equation and its applications-force on		
	pipe bend.	08-07-2019	
23	Closed conduit flow: Reynolds experiment-		
		10-07-2019	
24	Darcy Weisbach equation	10-07-2019	
	Durey Weisouen equation	11.07.2010	
25	Minor logges in minor 1	11-07-2019	
23	Minor losses in pipes-losses due to sudden		
	expansion, contraction, pipe bend, couplings e.t.c	12-07-2019	
26	pipes in series and pipes in parallel	manay isa sara	
	T T Put and Pu	15-07-2019	
27	Total energy line-,hydraulic gradient line.	13-07-2019	
	gradient mie.	16.07.2010	
		16-07-2019	

# UNIT-III BOUNDARY LAYER THEORY, DIMENSIONAL ANALYSIS

**CO3:** Analyze dfferentconcepts related to boundary layer theory, flow separation, basic concepts of velocity profiles, dimensionless numbers and dimensional analysis.

TB: Fluid mechanics and Hydraulic machines-Dr.R.K.Bansal

28	Introduction: Downday 1 D 1 1		
20	Introduction: Boundary layer, Bondary layer formation over flat plate	17-07-2019	
29	Displacement, momentum, energy thickness	17 07 2013	
	, , , , , , , , , , , , , , , , , , ,	18-07-2019	
30	momentum integral equation,		
-		19-07-2019	
31	Separation of boundary layer, control of flow separation,		Lecture
		20-07-2019	
32	Stream lined body, Bluff body and its		interspersed
	applications	22-07-2019	with
33	Basic concepts of velocity profiles.		discussions
		23-07-2019	
34	Dimensionless numbers-reynold's, weber,		
	froud's, mach numbers	24-07-2019	
TINITT IX	DAGLOG OF TUDBO MA CONTRACT		

#### UNIT-IV BASICS OF TURBO MACHINERY

CCO4: Able to determine hydrodynamic forces on various types of vanes

TB: Fluid mechanics and Hydraulic machines-Dr. R. K. Bansal

35	hydrodynamic force of jets on stationary flat, inclined, and curved vanes	25-07-2019	
36			

	hydrodynamic force of jets on moving flat, inclined curved vanes	26-07-2019	Lecture interspersed
37	Force of jet on moving curved vanes at centre, at tip and velocity diagram concept	27-07-2019	with discussions
38	Flow over radial vanes.	29-07-2019	
UNIT-V	CENTRIFUGAL PUMPS, RECIPROCATING PU	JMPS	
CO5: Able to	understand the working of pumps and study their char	acteristics	
	echanics and Hydraulic machines-Dr.R.K.Bansal		
39	Classification of pumps	30-07-2019	
40	working, work done of centrifugal pump	31-07-2019	
41	Heads of a pump-manometric head, suction head, delivery head, static head	01-08-2019	
42	losses and efficiencies	02-08-2019	
43	specific speed-derivation	03-08-2019	Lecture
44	pumps in series and parallel	05-08-2019	interspersed with
45	cavitation & NPSH.	06-09-2019	discussions
46	Reciprocating pumps classification and Working	07-08-2019	
47	Discharge, slip	08-08-2019	
48	Indicator diagrams.	09-08-2019	

# UNIT-VI HYDRAULIC TURBINES, PERFORMANCE OF HYDRAULIC TURBINES

**CO6:** Able to design various components of turbines and study their characteristics and also evaluate the performance of turbines.

T TB: Fluid mechanics and Hydraulic machines-Dr.R.K.Bansal

49	Classification of turbines	F 17 F 17 1 1 5 1 4	
		13-08-2019	
50	Impulse- Pelton wheel, working, work done,		
	efficiency	14-08-2019	Lecture
51	Reaction turbine-Francis turbine, working, work		interspersed
	done, efficiency	16-08-2019	with
52	Kaplan turbine-,working, work done, efficiency		discussions
		17-08-2019	
53	draft tube- theory		
		22-08-2019	
54	characteristic curves- main characterstic curves,		
	operating, constant efficiency curves	26-08-2019	
55	governing of turbines, selection of type of turbine		
		29-08-2019	
56	cavitation, surge tank, water hammer		

56	cavitation, surge tank, water hammer	
		04-09-2019
57	Hydraulic systems-hydraulic ram, hydraulic lift	
		06-09-2019
58	hydraulic coupling, Fluidics – amplifiers	
		13-09-2019
59	Revision of unit-I	
		17-09-2019
60	Revision of unit-II	
		24-09-2019
61	Revision of unit-1II	
		27-09-2019
62	Revision of unit-1V	
		28-09-2019
63	Revision of unit-V	
		01-10-2019
64	Revision of unit-I	
		02-10-2019

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Signature of HOD

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# TENTATIVE LESSON PLAN: RT RT21026 MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

Course Title: MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS				
Section : Sec A Date : 10/06/2019 Page No : 01 of 05				
Revision No: 00	Prepared By : G.SREELALITHA	Approved By : HOD		

Tools: Black board

No. of Periods	TOPIC	Date	Mode of
			Delivery

#### UNIT -I INTRODUCTION TO MANAGERIAL ECONOMICS

CO1: To acquaint the student with basic knowledge of managerial economics, managerial decision areas, basic economics tools, concept of demand, law of demand, elasticity of demand, types of elasticity measurements of elasticity and demand forecasting.

TB:: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH.

1	Introduction to ME, Def, Characteristics of ME	14-06-2019	
2	Nature and Scope of Managerial Economics	14-06-2019	
3	Managerial Economics related to Other Areas	18-06-2019	
4	Basic Economic Tools in ME	18-06-2019	
5	Introduction to Demand – Meaning & Definition, Features of Demand	19-06-2019	Lecture intersperse d
6	Determinants of Demand	20-06-2019	with discussions
7	Law of Demand & Its exceptions, Demand Function	21-06-2019	
8	Introduction to Elasticity of Demand	24-06-2019	
9	Types of Elasticity of Demand	25-06-2019	
10	Types of price Elasticity of Demand	26-06-2019	
11	Measurement of Price Elasticity of Demand	27-06-2019	
12	Introduction Demand Forecasting	30-06-2019	
13	Importance of Demand Forecasting	01-07-2019	
14	Demand Forecasting Methods	03-07-2019	1.5

# UNIT -II PRODUCTION, PRODUCTION FUNCTION&COST ANALYSIS

CO2: TO acquaint the student with basic knowledge of production, factors of production, various production functions, least cost combinations of inputs, cost concepts, breakeven analysis to avoid losses.

TB: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH.

15	Introduction to Production : Meaning & Definition, Production Function	06/07/2019	
16	Factors of production, production function with one variable factor	06/07/2019	
17	Law of Variable Proportions	07/07/2019	
18	Factors of production, production function with two variable factors	10/07/2019	Lecture
19	Concept of Isocosts, Isoquants	09/07/2019	intersperse
20	MRTS, Least Cost Combination	14/07/2019	d with
21	Cobb-Douglas Production Function	14/07/2019	discussions
22	Economies of Scale& diseconomies of scale	15/07/2019	
23	Returns to Scale & returns to factors	15/07/2019	
24	Concept of cost & Various Cost Concepts	16/07/2019	
25	Introduction to Break Even Analysis	18/07/2019	
26	Determination of Break Even Point with Graph	18/07/2019	
27	Calculation of Break Even Point (BEP) algebraic method	30/07/2019	
28	Tutorial	30/07/2019	

UNIT - III

MARKETS AND COMPETITION, PRICING POLICIES

CO3: Gain knowledge about market, types of markets, competition, price determination under different market conditions, And various pricing methods.

29	Introduction to Markets: Meaning &	01/08/2019	
30	Definition, Features	00/00/00/0	
30	Types of markets, market structure	02/08/2019	
31	Price Determination under perfect competition	03/08/2019	
32	Equilibrium point of firm and industry	05/08/2019	Lecture
33	Price Determination under Monopoly	07/08/2019	intersperse d with
34	Equilibrium point of firm and industry in monopoly	12/08/2019	discussions
35	Price Determination under Monopolistic Competition	12/08/2019	
36	Price Determination under Oligopoly	13/08/2019	
37	Managerial Theories of the Firm	13/08/2019	
38	Marries and Williamson theory of firm	14/08/2019	
39	Pricing, pricing objectives.	14/08/2019	
40	Various Methods of Pricing	16/08/2019	

## UNIT – IV FORMS OF BUSINESS ORGANIZATIONS AND BUSINESS CYCLE

CO4: TO understand about business, types of business like sole trader ship, partnership, joint stock companies, business cycle.

TB: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH

41	Introduction to Business: Definition, Features		
		23-08-2019	
42	Sole Proprietorship: Features, Merits, Demerits	25-08-2019	
43	Partnership: Features, Merits, Demerits, kinds of partners	26-08-2019	Lecture intersperse d
44	Joint Stock Company : Features, Merits, Demerits	27-08-2019	with discussions
45	Public limited and pvt ltd companies, features		

X w		29-08-2019
46	Public Enterprises : Features, Merits, Demerits	29-08-2019
17	Phases of Business Cycles	30-08-2019

## UNIT - V INTRODUCTION TO FINANCIAL ACCOUNTING

CO5: TO know and understand about accounting process, types of accounts, principles of accounting, preparation of journal, ledger, trail balance and final accounts

TB: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH

48	Introduction to Accounting: Meaning &	03/09/2019	
	Definition, Classification of Accounts		
49	Accounting Process	04/09/2019	
50	Principles of accounting(GAAP)	05/09/2019	
51	Accounting cycle	05/09/2019	
52	Preparation of Journal: Problems	06/09/2019	Lecture intersperse
53	Preparation of Ledger: Problems	06/09/2019	d with
54	Preparation of Trail Balance: Problems	06/09/2019	discussions
55	Final Accounts (Trading ,profit & loss A/C, Balance Sheet)	09/09/2019	
56	Final Accounts with Adjustments	10/09/2019	
57	Treatment of adjustments in preparation of final accounts.	10/09/2019	
58	Introduction to Financial Statement Analysis: Importance, Objectives.	10/09/2019	
59	Classification of Ratios : Liquidity Ratios	12/09/2019	
60	Classification of Ratios : Activity Ratios	12/09/2019	
61	Classification of Ratios : Solvency Ratios	13/09/2019	
62	Preparation of Changes in Working Capital	13/09/2019	

63	Preparation of & Cash Funds Flow Statement	13/09/2019	

## UNIT - VI CAPITAL, CAPITAL BUDGETING DECISIONS

CO6: TO understand about Capital, types of capital, capital budgeting decisions, process of capital budgeting, methods or techniques of capital budgeting.

TB: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH

64	Introduction to Capital Budgeting: Meaning, Definition, Need.	13/10/2019	
65	Methods of Capital Budgeting: Pay Back Period (PBP),	14/10/2019	
66	Calculation of Accounting Rate of Return (ARR)	15/10/2019	Lecture intersperse
67	Calculation of Net Present Value (NPV)	16/10/2019	d with discussions
68	Calculation of Internal Rate of Return (IRR)	19/10/2019	
69	Calculation of Profitability Index	23/10/2019	
70	Merits and Demerits of Capital Budgeting Techniques.	25/10/2019	
71	Previous QP problems solution	25/10/2019	

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# TENTATIVE LESSON PLAN: RT RT21026 MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

Course Title: MAN	AGERIAL ECONOMICS AND FINANCI	AL ANALYSIS
Section : Sec B	Date: 10/06/2019	Page No: 01 of 05
Revision No : 00	Prepared By : G.SREELALITHA	Approved By: HOD

Tools: Black board

I UUIS. DIMER DUME			0
No. of Periods	TOPIC	Date	Mode of Delivery

## UNIT -I INTRODUCTION TO MANAGERIAL ECONOMICS

CO1: To acquaint the student with basic knowledge of managerial economics, managerial decision areas, basic economics tools, concept of demand, law of demand, elasticity of demand, types of elasticity measurements of elasticity and demand forecasting.

TB:: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH.

1	Introduction to ME, Def, Characteristics of ME	11-06-2019	
2	Nature and Scope of Managerial Economics	12-06-2019	
3	Managerial Economics related to Other Areas	13-06-2019	
4	Introduction to Demand – Meaning & Definition, Features of Demand	14-06-2019	Lecture
5	Determinants of Demand	15-06-2019	intersperse
6	Law of Demand & Its exceptions, Demand Function	17-06-2019	with discussions
7	Introduction to Elasticity of Demand	18-06-2019	
8	Types of Elasticity& price Elasticity of Demand	19-06-2019	
9	Introduction Demand Forecasting	20-06-2019	
10	Importance& Methods of Demand Forecasting	21-06-2019	

## UNIT -II PRODUCTION, PRODUCTION FUNCTION&COST ANALYSIS

CO2: TO acquaint the student with basic knowledge of production, factors of production, various production functions, least cost combinations of inputs, cost concepts, breakeven analysis to avoid losses.

TB: A.R.Arya sri, "Managerial Economics &	& Financial Analysis", 2005, TMH.
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11	Introduction to Production : Meaning & Definition, Production Function	22-06-2019	
12	Factors of production, production function with one variable factor	24-06-2019	
13	Law of Variable Proportions	25-06-2019	
14	Factors of production, production function with two variable factors	26-06-2019	Lecture
15	Concept of Isocosts, Isoquants	27-06-2019	intersperse
16	MRTS, Least Cost Combination	28-06-2019	with discussions
17	Cobb-Douglas Production Function	29-06-2019	discussions
18	Economies of Scale& diseconomies of scale	02-07-2019	
19	Returns to Scale & returns to factors	03-07-2019	
20	Concept of cost & Various Cost Concepts	04-07-2019	
21	Introduction to Break Even Analysis	05-07-2019	
22	Determination of Break Even Point with Graph	06-07-2019	
23	Calculation of Break Even Point (BEP) algebraic method	08-07-2019	
24	Tutorial COMPETERION B	09-07-2019	

## UNIT - III

# MARKETS AND COMPETITION, PRICING POLICIES

CO3: Gain knowledge about market, types of markets, competition, price determination under different market conditions, And various pricing methods.

TB: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH.

25 Introduction to M Definition, Featur	Tarkets: Meaning & 10-07-2019
26 Types of markets	, market structure
27 Price Determination	on under perfect competition 01/08/2019

28	Equilibrium point of firm and industry	02/08/2019	Lecture intersperse
29	Price Determination under Monopoly	03/08/2019	d with
30	Equilibrium point of firm and industry in monopoly	05/08/2019	discussions
31	Price Determination under Monopolistic Competition	07/08/2019	
32	Price Determination under Oligopoly	12/08/2019	
33	Managerial Theories of the Firm	12/08/2019	
34	Marries and Williamson theory of firm	13/08/2019	
35	Pricing, pricing objectives.	13/08/2019	
36	Various Methods of Pricing	14/08/2019	

## UNIT – IV FORMS OF BUSINESS ORGANIZATIONS AND BUSINESS CYCLE

CO4: TO understand about business, types of business like sole trader ship, partnership, joint stock companies, business cycle.

TB: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH

37	Introduction to Business: Definition, Features	23-08-2019	Lecture intersperse
38	Sole Proprietorship: Features, Merits, Demerits	25-08-2019	
39	Partnership: Features, Merits, Demerits, kinds of partners	26-08-2019	
40	Joint Stock Company : Features, Merits, Demerits	27-08-2019	
41	Public limited and pvt ltd companies, features	29-08-2019	
42	Public Enterprises : Features, Merits, Demerits	29-08-2019	d with
43	Phases of Business Cycles	30-08-2019	discussions

#### UNIT - V INTRODUCTION TO FINANCIAL ACCOUNTING

CO5: TO know and understand about accounting process, types of accounts, principles of accounting, preparation of journal, ledger, trail balance and final accounts

TB: A.R.Arya sri, "Managerial Economics & Financial Analysis", 2005, TMH

44	Introduction to Accounting : Meaning & Definition, Classification of Accounts	03/09/2019	
45	Accounting Process	04/09/2019	
46	Principles of accounting(GAAP)	05/09/2019	
47	Accounting cycle	05/09/2019	
48	Preparation of Journal : Problems	06/09/2019	Lecture intersperse
49	Preparation of Ledger : Problems	06/09/2019	d with
50	Preparation of Trail Balance : Problems	06/09/2019	discussions
51	Final Accounts (Trading ,profit & loss A/C, Balance Sheet)	09/09/2019	
52	Final Accounts with Adjustments	10/09/2019	
53	Treatment of adjustments in preparation of final accounts.	10/09/2019	
54	Introduction to Financial Statement Analysis: Importance, Objectives.	10/09/2019	
55	Classification of Ratios : Liquidity Ratios	10/09/2019	
56	Classification of Ratios : Activity Ratios	12/09/2019	
57	Classification of Ratios : Solvency Ratios	12/09/2019	
58	Classification of Ratios :Profitability Ratios	13/09/2019	
59	Preparation of Changes in Working Capital	13/09/2019	
60	Preparation of Cash& Funds Flow Statement	13/09/2019	

## UNIT - VI CAPITAL, CAPITAL BUDGETING DECISIONS

CO6: TO understand about Capital, types of capital, capital budgeting decisions, process of capital budgeting, methods or techniques of capital budgeting.

62	Introduction to Capital Budgeting: Meaning, Definition, Need.	13/10/2019	
63	Methods of Capital Budgeting: Pay Back Period (PBP),	14/10/2019	
64	Calculation of Accounting Rate of Return (ARR)	15/10/2019	Lecture
65	Calculation of Net Present Value (NPV)	16/10/2019	intersperse d
66	Calculation of Internal Rate of Return (IRR)	19/10/2019	with discussions
67	Calculation of Profitability Index	23/10/2019	
68	Merits and Demerits of Capital Budgeting Techniques.	25/10/2019	
69	Previous QP problems solution	25/10/2019	

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# TENTATIVE LESSON PLAN: R1631031 DYNAMICS OF MACHINERY

Course Title:	DYNAMICS OF MACHINERY		
Section : A	Date: 12.06.2019	Page N	0 • 01 of 02
Revision No:	Prepared By: Mr. BALA	Page No: 01 of 03 Approved By: HOI	
1996	CHINALINGAM VANAM		
Tools: Black b	oard, PPTs		
No. of	TOPIC	Date	Mode of
Periods		Dute	Delivery
	ECESSION		
TD . "The	dentify stabilization of sea vehicles, aircrafts	and automobil	le vehicles.
	Thurm's.Chand.		
1	Introduction	12.06.2019	
2	Gyroscope effect on areoplanes with	12.06.2019	
3	problems		
3	Gyroscope effect on naval ships with	13.06.2019	
4	Gyroscope effect on 2 who had a		
5	Gyroscope effect on 2-wheeler vehicle	15.06.2019	\I aatuus
6	Illustrative problems on 2-wheeler vehicle	16.06.2019	Lecture
	Gyroscope effect on 4-wheeler vehicle with problems	17.06.2019	interspersed with
7	Gyroscope effect on disc with problems	19.06.2019	discussions
8	Gyroscope effect on bearings with problems	19.06.2019	
9 -	Static force & Dynamic force analysis on	20.06.2019	
10	planar mechanism		
10	Illustrative problems on static force &	22.06.2019	
UNIT-II	dynamic force analysis		
	FRICTION, CLUTCHES, BRAKES & DYN	AMOMETER	S
TB: "Theory o	lentify frictional losses, torque transmission of Machines" / S.S Ratan/ Mc. Graw Hill Publ	of mechanical s	ystems.
11	FRICTION: Introduction I I'm I in		
12	FRICTION: Introduction, Inclined plane	23.06.2019	
13	Friction of screw and nuts with problems	24.06.2019	
	Pivot and collar, Uniform pressure, Uniform wear	29.06.2019	
14	Friction circle & Friction axis	01.07.0010	Lecture
15	Lubricating surfaces & Boundary friction	01.07.2019	interspersed
16	Illustrative problems on film lubrication	01.07.2019	with
17	CLUTCHES: Introduction-Friction clutches	03.07.2019	discussions
18	Single disc (or) Plate clutch	03.07.2019	
19	Multidisc clutch with problems	04.07.2019	
20	Cone clutch with problems	07.07.2019	
21	Centrifugal clutch with problems	07.07.2019	
	Brakes and Dynamometers: Introduction	10.07.2019	
	Simple block brakes	11.07.2019	
		13.07.2019	

24	Illustrative problems on simple block brakes	14.07.2019	
25	Internal expanding brake with problems	15.07.2019	+
26	Band brake on vehicles with problems	17.07.2019	
27	General description & operation of	18.07.2019	
	dynamometers	10.07.2019	
28	Prony dynamometer	19.07.2019	
29	Rope brake dynamometer with problems	20.07.2019	
30	Epicyclic & Bevis-Gibson dynamometers	21.07.2019	
31	with problems		
UNIT-III	Bevis-Gibson dynamometers with problems TURNING MOMENT DIAGRAMS	24.07.2019	
TB: "Theo	to design dynamic force analysis of slider cran		and design o
32	Introduction	24.07.2019	Lecture
33	Dynamic force analysis of slider crank mechanism	25.07.2019	interspersed
34	Inertia torque, angular velocity of connecting rod	26.07.2019	discussions
35	Acceleration of connecting rod, crank effort	28.07.2019	
36	*Turning moment diagram of fluctuation of energy *	29.07.2019	
37	Coefficient of fluctuation of speed	31.07.2019	
38	Fly wheel and their design with problems	01.08.2019	
39	Fly wheel and their design & Turning moment diagrams with problems	05.08.2019	
40	Illustrative problems on Turning moment diagram	07.08.2019	
UNIT-IV	GOVERNORS		
TB: "Theo	ory of Machines" / S.S Ratan/ Mc. Graw Hill Pul	dition.	
41	Introduction & Different types of governors	21.08.2019	
42	Watt governor with problems		
43	Porter governor with problems	21.08.2019	
	Proell governor with problems	22.08.2019	
44		25.08.2019	Lecture interspersed with discussions
45	Spring loaded governors	28.08.2019	
46	Hartnell governor with auxiliary springs with problems	28.08.2019	
47	Hartung governor with auxiliary springs with problems	29.08.2019	
48	Sensitiveness, Isochronisms & Hunting	02.09.2019	
NIT-V	BALANCING		
O5: Able to TB: "Theo	design balancing of reciprocating and rotary m ry of machines" / Khurmi / S.Chand.	asses.	
49	Introduction	04.09.2019	
		07.07.2019	

50	Balancing of rotating mass single & multiple planes	05.09.2019	]
51	Use of analytical & graphical methods	07.09.2019	Lecture interspersed with discussions
52	Illustrative problems on single planes on rotating masses	08.09.2019	
53	Illustrative problems on different planes on rotating masses	09.09.2019	
54	Primary, secondary & higher balancing of reciprocating mass	11.09.2019	
55	Analytical & Graphical methods with forces & couples diagrams	12.09.2019	
56	Locomotive balancing	14.09.2019	
57	Hammer blow, swaying couple & variation of tractive efforts	18.09.2019	
IINIT-VI	VIRDATIONS		

**VIBRATIONS** 

CO6: Able to the identify frequencies of continuous systems starting from the general equation of displacement.

TB: "Theory of Machines" / S.S Ratan/ Mc. Graw Hill Publ.

	1 Wachines / S.S Ratan/ Wic. Graw Hill Publ	•	
58	Introduction, Types of vibrations, Free vibration of simple mass system	18.09.2019	rd.
59	Oscillation of pendulum, centers of oscillations & suspensions, transverse loads, variation of beams with UDL	19.09.2019	
60	Dunkerley's & Rayleigh's method	21.09.2019	
61 *	Illustrative problems on Transverse loads with UDL	22.09.2019	
62	Illustrative problems on Dunkerley's method	23.09.2019	
63	Illustrative problems on Rayleigh's method	25.09.2019	Lecture
64	Illustrative problems on Forced damped vibration	26.09.2019	interspersed with
65	Illustrative problems on Forced damped vibration	26.09.2019	discussions
66	Whirling of shafts, critical speeds	26.09.2019	
67	Torsional vibrations-Two and Three rotor systems	28.09.2019	
68	Illustrative problems on Two rotor system	29.09.2019	
69	Illustrative problems on Forced damped vibration & vibration isolation	06.10.2019	
70	Illustrative problems on vibration isolation & Transmissibility	07.10.2019	

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## TENTATIVE LESSON PLAN: R1631031 DYNAMICS OF MACHINERY

Course Title: D	YNAMICS OF MACHINERY			
Section: B	Date: 12.06.2019	Page No	:01 of 03	
Revision No: 0	Trepared by : Wit. Bithi		Approved By: HOD	
	CHINALINGAM VANAM			
Tools: Black bo	oard, PPTs			
No. of	TOPIC	Date	Mode of	
Periods			Delivery	
	CESSION			
	lentify stabilization of sea vehicles, aircrafts a f machines" / Khurmi / S.Chand.	nd automobile	e vehicles.	
1	Introduction	12.06.2019		
2	Gyroscope effect on areoplanes with problems	12.06.2019		
3	Gyroscope effect on naval ships with problems	13.06.2019		
4	Gyroscope effect on 2-wheeler vehicle	15.06.2019		
5	Illustrative problems on 2-wheeler vehicle	16.06.2019	Lecture	
6	Gyroscope effect on 4-wheeler vehicle with problems	17.06.2019	interspersed with	
7	Gyroscope effect on disc with problems	19.06.2019	discussions	
8	Gyroscope effect on bearings with problems	19.06.2019		
9 -	Static force & Dynamic force analysis on	20.06.2019		
	planar mechanism			
10	Illustrative problems on static force &	22.06.2019		
	dynamic force analysis			
UNIT-II	FRICTION, CLUTCHES, BRAKES & DYNA	AMOMETER	S	
CO2: Able to i	dentify frictional losses, torque transmission o	f mechanical s	systems.	
	of Machines" / S.S Ratan/Mc. Graw Hill Publ	23.06.2019		
11	FRICTION: Introduction, Inclined plane			
12	Friction of screw and nuts with problems	24.06.2019		
13	Pivot and collar, Uniform pressure, Uniform	29.06.2019	T .	
14	Wear	01.07.2010	Lecture	
14	Friction circle & Friction axis	01.07.2019 01.07.2019	interspersed	
15	Lubricating surfaces & Boundary friction		with	
16	Illustrative problems on film lubrication	03.07.2019	discussions	
17	CLUTCHES: Introduction-Friction clutches	03.07.2019		
18	Single disc (or) Plate clutch	04.07.2019		
19	Multidisc clutch with problems	07.07.2019		
20	Cone clutch with problems	07.07.2019		
21	Centrifugal clutch with problems	10.07.2019		
22	Brakes and Dynamometers: Introduction	11.07.2019		
	Simple block brakes			

Illustrative problems on simple block brakes	14.07.2019	
Internal expanding brake with problems	15.07.2019	
	17.07.2019	
General description & operation of	18.07.2019	
Prony dynamometer	19.07.2019	
Rope brake dynamometer with problems	20.07.2019	
Epicyclic & Bevis-Gibson dynamometers with problems	21.07.2019	
	24.07.2019	
of Machines" / S.S Ratan/ Mc. Graw Hill Publ		Lecture
		interspersed
		with
Inertia torque, angular velocity of connecting	26.07.2019	discussions
Acceleration of connecting rod, crank effort	28.07.2019	
Turning moment diagram of fluctuation of energy	29.07.2019	
Coefficient of fluctuation of speed	31.07.2019	
Fly wheel and their design with problems	01.08.2019	
Fly wheel and their design & Turning	05.08.2019	
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment	05.08.2019 07.08.2019	
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different con	07.08.2019	
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different corry of Machines" / S.S Ratan/ Mc. Graw Hill Pu	07.08.2019	
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different corry of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors	07.08.2019  adition. bl. 21.08.2019	
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different comy of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems	07.08.2019 adition. bl.	
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different comy of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems  Porter governor with problems	07.08.2019  adition. bl. 21.08.2019 21.08.2019	Lecture
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different corry of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems  Porter governor with problems  Proell governor with problems	07.08.2019  adition. bl. 21.08.2019 21.08.2019 22.08.2019	Lecture intersperse
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different comy of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems  Porter governor with problems  Proell governor with problems  Spring loaded governors	07.08.2019  adition. bl. 21.08.2019 21.08.2019 22.08.2019 25.08.2019 28.08.2019	
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different corry of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems  Porter governor with problems  Proell governor with problems  Spring loaded governors  Hartnell governor with auxiliary springs with problems	07.08.2019  adition. bl. 21.08.2019 21.08.2019 22.08.2019 25.08.2019 28.08.2019 28.08.2019	intersperse
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different comy of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems  Porter governor with problems  Proell governor with problems  Spring loaded governors  Hartnell governor with auxiliary springs with problems  Hartung governor with auxiliary springs with problems	07.08.2019  adition. bl. 21.08.2019 21.08.2019 22.08.2019 25.08.2019 28.08.2019 28.08.2019 29.08.2019	intersperse with
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different comy of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems  Porter governor with problems  Proell governor with problems  Spring loaded governors  Hartnell governor with auxiliary springs with problems  Hartung governor with auxiliary springs	07.08.2019  adition. bl. 21.08.2019 21.08.2019 22.08.2019 25.08.2019 28.08.2019 28.08.2019	intersperse with
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different comy of Machines" / S.S Ratan/ Mc. Graw Hill Pu Introduction & Different types of governors  Watt governor with problems  Porter governor with problems  Proell governor with problems  Spring loaded governors  Hartnell governor with auxiliary springs with problems  Hartung governor with auxiliary springs with problems  Sensitiveness, Isochronisms & Hunting  BALANCING	07.08.2019  adition. bl. 21.08.2019 21.08.2019 22.08.2019 25.08.2019 28.08.2019 28.08.2019 29.08.2019 02.09.2019	intersperse with
Fly wheel and their design & Turning moment diagrams with problems  Illustrative problems on Turning moment diagram  GOVERNORS  design of governor its working in different corry of Machines" / S.S Ratan/ Mc. Graw Hill Pu  Introduction & Different types of governors  Watt governor with problems  Porter governor with problems  Proell governor with problems  Spring loaded governors  Hartnell governor with auxiliary springs with problems  Hartung governor with auxiliary springs with problems  Sensitiveness, Isochronisms & Hunting	07.08.2019  adition. bl. 21.08.2019 21.08.2019 22.08.2019 25.08.2019 28.08.2019 28.08.2019 29.08.2019 02.09.2019	intersperse with
	Internal expanding brake with problems  Band brake on vehicles with problems  General description & operation of dynamometers  Prony dynamometer  Rope brake dynamometer with problems  Epicyclic & Bevis-Gibson dynamometers with problems  Bevis-Gibson dynamometers with problems  TURNING MOMENT DIAGRAMS  design dynamic force analysis of slider crank  of Machines" / S.S Ratan/ Mc. Graw Hill Pub  Introduction  Dynamic force analysis of slider crank mechanism  Inertia torque, angular velocity of connecting rod  Acceleration of connecting rod, crank effort  Turning moment diagram of fluctuation of energy  Coefficient of fluctuation of speed	Internal expanding brake with problems  Band brake on vehicles with problems  General description & operation of dynamometers  Prony dynamometer  Prony dynamometer  Rope brake dynamometer with problems  Epicyclic & Bevis-Gibson dynamometers with problems  Bevis-Gibson dynamometers with problems  Bevis-Gibson dynamometers with problems  PURNING MOMENT DIAGRAMS  design dynamic force analysis of slider crank mechanism and of Machines" / S.S Ratan/Mc. Graw Hill Publ.  Introduction  Dynamic force analysis of slider crank mechanism  Inertia torque, angular velocity of connecting rod  Acceleration of connecting rod, crank effort  Turning moment diagram of fluctuation of energy  Coefficient of fluctuation of speed  31.07.2019

50	Balancing of rotating mass single & multiple planes	05.09.2019	Lecture interspersed with discussions
51	Use of analytical & graphical methods	07.09.2019	
52	Illustrative problems on single planes on rotating masses	08.09.2019	
53	Illustrative problems on different planes on rotating masses	09.09.2019	
54	Primary, secondary & higher balancing of reciprocating mass	11.09.2019	
55	Analytical & Graphical methods with forces & couples diagrams	12.09.2019	
56	Locomotive balancing	14.09.2019	
57	Hammer blow, swaying couple & variation of tractive efforts	18.09.2019	
UNIT-VI	VIBRATIONS		
CO6: Able t	o the identify frequencies of continuous system	s starting from	m the general

	7 Machines / S.S Ratan/ Mc. Graw Hill Pub	<b>l.</b>	
58	Introduction, Types of vibrations, Free vibration of simple mass system	18.09.2019	
59	Oscillation of pendulum, centers of oscillations & suspensions, transverse loads, variation of beams with UDL	19.09.2019	
60	Dunkerley's & Rayleigh's method	21.09.2019	
61	Illustrative problems on Transverse loads with UDL	22.09.2019	
62	Illustrative problems on Dunkerley's method	23.09.2019	
63	Illustrative problems on Rayleigh's method	25.09.2019	Lecture
64	Illustrative problems on Forced damped vibration	26.09.2019	interspersed with
65	Illustrative problems on Forced damped vibration	26.09.2019	discussions
66	Whirling of shafts, critical speeds	26.09.2019	
67	Torsional vibrations-Two and Three rotor systems	28.09.2019	
68	Illustrative problems on Two rotor system	29.09.2019	
69	Illustrative problems on Forced damped vibration & vibration isolation	06.10.2019	
70	Illustrative problems on vibration isolation & Transmissibility	07.10.2019	

Signature of HOD

# **TENTATIVE LESSON PLAN: R1631032**

Course Title: I	METAL CUTTING AND MACHINE TOOLS	Course code:	D1631032
Section : Sec.	Date: 10/6/2019		: 01 to 03
Revision No: (	Prepared By: R. KARUN KUMAR		ed By : HOD
Tools: BLACK	BOARD	Approv	ed by . HOD
No. of Periods	TOPIC	Date	Mode of Delivery
	PAMENTAL OF MACHINING		
CO1: Students	will be able to understand apply cutting mechanics	to metal machi	ning based on
cutting force an	d power consumption.	to metal macin	ining based on
TB: "MANUF	ACTURING PROCESSES" / JP KAUSHISH/ PH	II Dublishows 1	. F.J.4:
1	Elementary treatment of metal cutting	11/6/2019	nd Edition
		11/0/2019	
2	Elements of cutting processes	12/6/2019	
3	Geometry of single point cutting tool	13/6/2019	
4	Tool angles, chip formation, types of chips	14/6/2019	Lecture
5	Built-up edge and its effects	15/6/2019	interspersed
6	Chip breakers, mechanics of orthogonal cutting	18/6/2019	with
7	Merchants force diagram, cutting forces	19/6/2019	discussions
8	Cutting speed, feed and depth of cut	20/6/2019	aiscussions
9	Tool life, tool wear, machinability	21/6/2019	
10	Economics of machining, coolants, tool material	22/6/2019	
	and properties.		
CO2: Students etc.	HE MACHINES will be able to operate lathe, milling machines, dr		
11 11	CTURING PROCESSES" / JP KAUSHISH/ PH		d Edition.
12	Principle of working, specifications of lathes	25/6/2019	
	Types of lethes week hall 1. 11.11	00101	
12	Types of lathes, work holders and tool holders	26/6/2019	
13	Types of lathes, work holders and tool holders Box tools, taper turning	27/6/2019	Lecture
13	Types of lathes, work holders and tool holders Box tools, taper turning Thread cutting for lathes	27/6/2019 28/6/2019	Lecture
	Types of lathes, work holders and tool holders  Box tools, taper turning  Thread cutting for lathes  Constructional features of speed and feed gear	27/6/2019	interspersed
14 15	Types of lathes, work holders and tool holders  Box tools, taper turning  Thread cutting for lathes  Constructional features of speed and feed gear box	27/6/2019 28/6/2019 29/6/2019	
14 15 16	Types of lathes, work holders and tool holders  Box tools, taper turning  Thread cutting for lathes  Constructional features of speed and feed gear box  Turret and capstan lathes, collet chucks	27/6/2019 28/6/2019 29/6/2019 29/6/2019	interspersed with
14 15 16 17	Types of lathes, work holders and tool holders  Box tools, taper turning  Thread cutting for lathes  Constructional features of speed and feed gear box  Turret and capstan lathes, collet chucks  Other work and tool holding devices	27/6/2019 28/6/2019 29/6/2019 29/6/2019 03/07/2019	interspersed with
14 15 16 17 18	Types of lathes, work holders and tool holders  Box tools, taper turning  Thread cutting for lathes  Constructional features of speed and feed gear box  Turret and capstan lathes, collet chucks  Other work and tool holding devices  Principle features of automatic lathes	27/6/2019 28/6/2019 29/6/2019 29/6/2019 03/07/2019 05/07/2019	interspersed with
14 15 16 17	Types of lathes, work holders and tool holders  Box tools, taper turning  Thread cutting for lathes  Constructional features of speed and feed gear box  Turret and capstan lathes, collet chucks  Other work and tool holding devices	27/6/2019 28/6/2019 29/6/2019 29/6/2019 03/07/2019	interspersed with

UNIT-III SHAPING, SLOTTING, PLANNER, DRILLING AND BORING MACHINES CO3: Students will be able to select cutting tool materials and tool geometries for different metals.

# TB: "MANUFACTURING PROCESSES" / JP KAUSHISH / PHI Publishers-2nd Edition.

	*** 1.		A CONTRACTOR OF THE PARTY OF TH
21	Working principle and principle parts of shaper	17/7/2019	
22	Specifications & principle of operation of shaper	18/7/2019	
23	Machining time calculations of shaper	19/7/2019	
24	Principle parts, operations performed on slotter	20/7/2019	
25	Machining time calculations of slotter & principle of working of planner	20/7/2019	Lecture
26	Principle parts, operations performed on planner	23/7/2019	interspersed
27	Working specifications, types of drilling machines	24/7/2019	with discussions
28	Operations performed and tool holding devices of drilling machines	25/7/2019	
29	Twist drills and types	26/7/2019	
30	Machining time calculations of planner	27/7/2019	
31	Boring machines, fine boring machines	30/7/2019	
32	Jig boring machine, deep hole drilling machines	01/08/2019	

### UNIT-IV MILLING MACHINES

CO4: Students will be able to select appropriate machining processes and conditions for different metals.

## TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

33	Principles of working of milling machines	02/8/2019	
34	Specifications, classification of milling machines	03/8/2019	Lecture interspersed
35	Principle features of horizontal and vertical milling machines	16/8/2019	
36	Universal milling machines	17/8/2019	
37	Machining operations, types of cutter	17/8/2019	with
38	Geometry of milling cutter	20/8/2019	discussions
39	Methods of indexing	21/8/2019	
40	Accessories to milling machines	22/8/2019	

### UNIT-V FINISHING PROCESSES

CO5: Students will be able to learn machining economics

# TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

41	Theory of grinding	23/8/2019	Lecture
42	Classification of grinding machines	24/8/219	interspersed

43	Cylindrical & surface grinding machines	24/8/2019	with
44	Tools and cutter grinding machines	28/8/2019	discussions
45	Different types of abrasives	30/08/2019	
46	Bonds and specifications	31/08/2019	
47	Selection of grinding wheel	04/09/2019	
48	Lapping, honing operations	05/09/2019	
49	Broaching operations	12/09/2019	
50	Lapping, honing, broaching operation compared to grinding	13/09/2019	
TINITE VIV			

UNIT-VI JIGS & FIXTURES AND CNC MACHINE TOOLS

CO6: Students will be able to design jigs and Fixtures for simple parts and principles of CNC Machines

# TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

51	Principles of design of jigs and fixtures	17/09/2019	
52	Uses of jigs and fixtures	18/09/2019	
53	Classification of jigs and fixtures	20/09/2019	Lecture
54	Principle of location and clamping	20/09/2019	interspersed
55	Types of clamping	21/09/2019	with
56	Work holding devices	21/09/2019	discussions
57	Typical examples of jigs and fixtures	21/09/2019	
58	CNC machine tools	24/09/2019	
59	Working principle of CNC	25/09/2019	
60	Classification of CNC	26/09/2019	4.5
61	Constructional features of CNC	27/09/2019	
62	CNC controllers and types of motion controls	28/09/2019	
63	Types of motion controls in CNC	28/09/2019	
64	Applications of CNC machines	01/10/2019	

Signature of Faculty Date:

Signature of HOD

Date:

FRINCIPAL SRK Institute of Technology ENIKEPADU, VIJAYAWADA-521 108

# TENTATIVE LESSON PLAN: R1631032

Course Title: N	METAL CUTTING AND MACHINE TOOLS	Course code:	R1631032
Section : Sec ]	II Date: 10/6/2019		: 01 to 03
<b>Revision No:</b> 0	Vision No: 00 Prepared By: R. KARUN KUMAR Approved By		ed By : HOD
Tools: BLACK	BOARD	12001	ca by . Hob
No. of Periods	ТОРІС	Date	Mode of Delivery
UNIT-I FUND	AMENTAL OF MACHINING		
CO1: Students	will be able to understand apply cutting mechanics	to metal machi	ning based or
cutting force and	d power consumption.	to motal macin	ining bused of
TB: "MANUFA	ACTURING PROCESSES" / JP KAUSHISH/ PH	II Publishers	Edition
1	Elementary treatment of metal cutting	10/6/2019	and Edition
2	Elements of cutting processes	12/6/2019	
3	Geometry of single point cutting tool	12/6/2019	
4	Tool angles, chip formation, types of chips	13/6/2019	_
5	Built-up edge and its effects	15/6/2019	Lecture
6	Chip breakers, mechanics of orthogonal cutting	19/6/2019	interspersed
7	Merchants force diagram, cutting forces	19/6/2019	with
8	Cutting speed, feed and depth of cut	19/6/2019	discussions
9	Tool life, tool wear, machinability	20/6/2019	
10	Economics of machining, coolants, tool material and properties.	22/6/2019	
CO2: Students vetc.  TB:" MANUFA	IE MACHINES will be able to operate lathe, milling machines, dr CTURING PROCESSES" / JP KAUSHISH/ PH		
- 11	Principle of working, specifications of lathes	22/6/2019	
12	Types of lathes, work holders and tool holders	22/6/2019	
13	Box tools, taper turning	24/6/2019	
14	Thread cutting for lathes	26/6/2019	Lecture
15	Constructional features of speed and feed gear	26/6/2019	interspersed with
13	box		
16	box	27/06/2019	with discussions
	box Turret and capstan lathes, collet chucks	27/06/2019 29/06/2019	
16	box	29/06/2019	
16 17	box Turret and capstan lathes, collet chucks Other work and tool holding devices		

UNIT-III SHAPING, SLOTTING, PLANNER, DRILLING AND BORING MACHINES CO3: Students will be able to select cutting tool materials and tool geometries for different metals.

## TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

21	Working principle and principle parts of shaper	06/7/2019	
22	Specifications & principle of operation of shaper	06/7/2019	
23	Machining time calculations of shaper	06/7/2019	
24	Principle parts, operations performed on slotter	10/7/2019	
25	Machining time calculations of slotter & principle of working of planner	10/7/2019	Lecture interspersed with discussions
26	Principle parts, operations performed on planner	17/7/2019	
27	Working specifications, types of drilling machines	17/7/2019	
28	Operations performed and tool holding devices of drilling machines	17/7/2019	
29	Twist drills and types	18/7/2019	
30	Machining time calculations of planner	20/7/2019	
31	Boring machines, fine boring machines	20/7/2019	
32	Jig boring machine, deep hole drilling machines	24/07/2019	

#### UNIT-IV MILLING MACHINES

CO4: Students will be able to select appropriate machining processes and conditions for different metals.

### TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

33	Principles of working of milling machines	24/07/2019	
34	Specifications, classification of milling machines	24/07/2019	Lecture interspersed with discussions
35	Principle features of horizontal and vertical milling machines	25/07/2019	
36	Universal milling machines	27/07/2019	
37	Machining operations, types of cutter	27/07/2019	
38	Geometry of milling cutter	27/07/2019	
39	Methods of indexing	01/8/2019	
40	Accessories to milling machines	03/8/2019	

#### UNIT-V FINISHING PROCESSES

CO5: Students will be able to learn machining economics

TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

41	Theory of grinding	03/8/2019	Lecture
42	Classification of grinding machines	03/8/219	interspersed

Cylindrical & surface grinding machines	21/8/2019	with
Tools and cutter grinding machines	21/8/2019	discussions
Different types of abrasives	21/08/2019	
Bonds and specifications	22/08/2019	
Selection of grinding wheel		
Lapping, honing operations		
Broaching operations		
Lapping, honing, broaching operation compared to grinding	31/08/2019	
	Tools and cutter grinding machines Different types of abrasives Bonds and specifications Selection of grinding wheel Lapping, honing operations Broaching operations Lapping, honing, broaching operation compared	Tools and cutter grinding machines  Different types of abrasives  Bonds and specifications  Selection of grinding wheel  Lapping, honing operations  Broaching operations  Lapping, honing, broaching operation compared  Lapping, honing, broaching operation compared

UNIT-VI JIGS & FIXTURES AND CNC MACHINE TOOLS

CO6: Students will be able to design jigs and Fixtures for simple parts and principles of CNC Machines

TB: "MANUFACTURING PROCESSES" / JP KAUSHISH/ PHI Publishers-2nd Edition.

51	Principles of design of jigs and fixtures	31/08/2019	
52	Uses of jigs and fixtures	31/08/2019	
53	Classification of jigs and fixtures	04/09/2019	Lecture
54	Principle of location and clamping	04/09/2019	interspersed
55	Types of clamping	04/09/2019	with
56	Work holding devices	05/09/2019	discussions
57	Typical examples of jigs and fixtures	12/09/2019	
58	CNC machine tools	18/09/2019	
59	Working principle of CNC	18/09/2019	
60	Classification of CNC	18/09/2019	
61	Constructional features of CNC	18/09/2019	
62	CNC controllers and types of motion controls	21/09/2019	
63	Types of motion controls in CNC	21/09/2019	
64	Applications of CNC machines	01/10/2019	

Signature of Faculty Date:

PRINCIPAL

Signature of HOD Date:

SRK Institute of Technology ENIKEPADU, VIJAYAWADA-521 108

# TENTATIVE LESSON PLAN: R1631033

Course Title: I	DESIGN OF MACHINE MEMBERS-II	Course code	: R1631033
Section : Sec	= 100 0 10 0 2019	Page N	o: 01 to 03
Revision No : (		Approv	ed By : HOI
1 00IS: BLACK	BOARD, PPTs		
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I BEAR			
CO1: The stud	lent will able to select the suitable bearing base	ed on the appl	ication of th
loads and pred	ict the life of the bearing.		
ГВ: "DESIGN	OF MACHINE ELEMENTS", V.B.BHANDAR	I. 3rdEdition.	Tata McGra
Hill Education	Private Limited publications.	_,	THE MICOIA
1	Classification of bearings	10/6/2019	
2	applications. types of journal bearings	The second second second second	
3	lubrication — bearing modulus	12/6/2019 12/6/2019	
4	full and partial — clearance ratio		
5	clearance ratio, heat dissipation of bearings	13/6/2019	
6	bearing materials	15/6/2019	
7	Journal bearing	15/6/2019	-
8	design of ball bearings	15/6/2019	Lecture
9	design of roller bearings	19/6/2019	intersperse
10	static loading of ball bearings	19/6/2019	with
11	static loading of roller bearings	19/6/2019	discussion
12	bearing life	20/6/2019	
13	problems	22/6/2019	
14	Problems on bearings	22/6/2019	
15	problems	22/6/2019	
16	problems	24/6/2019	
	PAGGATA	26/6/2019	
NIT-II	ENGINE PARTS		
	esign the IC Engines parts.		
B: "DESIGN	OF MACHINE ELEMENTS" V R RHANDADI	2rdEdition T	ata MaC
Iill Education 1	Private Limited publications.	, 5 Eurion, 1	ata McGrav
17	Connecting Rod	26/6/2019	
18	Thrust in connecting rod	27/6/2019	Lecture
19	stress due to whipping action on connecting rod	29/6/2019	interspersed
20	Problems on stress due to whipping action on	03/7/2019	with
20	connecting rod	03/1/2019	discussions
21	cranks and crank shafts	03/7/2019	discussions
22	strength and proportions of over hung cranks	03/7/2019	
22	strength and properties of		
23 24	strength and proportions of over center cranks	06/7/2019	

	piston	
25	construction design and proportions of piston,cylinder,Bore and length of cylinder	06/7/2019
26	Thickness of cylinder wall, Stresses in cylinder wall, Cylinder head,	10/7/2019
27	Design of studs for cylinder head,problems,problems	10/7/2019
28	Pistons, piston materials, Thickness of piston head, piston ribs and cup, Piston rings, piston barrel, skirt	10/7/2019
29	Piston pin, problems, problems	17/7/2019

UNIT-III Design of curved beams

CO3: Able to design the curved beams, calculation of stresses in curved beams and expression for radius of neutral axis for curved beams with different cross-sections.

T TB1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private Limited publications.

TB2: "STRENGTH OF MATERIALS", Dr. R.K. BANSAL, 4th Edition,Laxmi Publications(P) Ltd.

30	Design of curved beams	20/7/2019		
31	Introduction, stresses in beams	24/7/2019		
32	Expression for radius of neutral axis rectangular section	25/7/2019		
33	Expression for radius of neutral axis circular section	27/7/2019		
34	Expression for radius of neutral axis trapezoidal section	27/7/2019	Lecture interspersed	
35	Expression for radius of neutral axis t-section	27/7/2019	with	
36	Design of crane hook	01/7/2019	discussions	
37	Design of c- clamp	01/7/2019	discussions	
38	Problems on radius of neutral axis rectangular section, circular section, trapezoidal section, t-section	01/7/2019		
39	Problems on crane hook	03/7/2019		
40	Problems on c- clamp	03/8/2019		
TINITE IN	DOWNER OF LANCE			

UNIT-IV POWER TRANSMISSIONS SYSTENLS, PULLEYS

CO4: Able to design power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws.

TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw

HIII Educatio	n Private Limited publications.		
41	Transmission of power by belt and drives transmission efficiencies	21/8/2019	
42	belts — flat and v types	21/8/2019	
43	ropes - pulleys for belt and rope drives	22/8/2019	
44	materials, chain drives	28/8/2019	Lecture
45	DESIGN OF POWER SCREWS : Design of screw	28/8/2019	interspersed with
46	square ACME, buttress screws, problems	28/8/2019	discussions
47	design of nut, compound screw	31/8/2019	
48	differential screw, ball screw	31/8/2019	
49	possible failures, Problems	31/8/2019	

### UNIT-V SPUR & HELICAL GEAR DRIVES

CO5: Able to design the spur & helical gear for different engineering applications.

TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw

Hill Education Private Limited publications.

50	Spur gears- helical gears, load concentration	31/8/2019	
	factor, flange couplings		
51	Dynamic load factor, surface compressive strength — bending strength,	04/9/2019	Lecture
52	design analysis of spur gears — estimation of centre distance,	04/9/2019	interspersed with
53	Module and face width, check for plastic creek for dynamic wear considerations, Problems	05/9/2019	discussions

### UNIT-VI MACHINE TOOL ELEMENTS

CO6: Able to design the Levers, brackets and Wire Ropes.

TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3<sup>rd</sup>Edition, Tata McGraw

Hill Education Private Limited publications.

54	Levers and brackets: design of levers	12/9/2019	
55	hand lever — cranked lever	18/9/2019	
bewer of	a lever loaded safety valve- rocker arm straight	18/9/2019	Lecture
57	Angular design of a crank pin	18/9/2019	interspersed
58	Wire Ropes	21/9/2019	with
59	Construction, Designation, Stresses in wire ropes	21/9/2019	discussions
60	sheaves and & drums	01/10/2019	

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# **TENTATIVE LESSON PLAN: R1631033**

Course Title: D	ESIGN OF MACHINE MEMBERS-II	Course code:	
Section : Sec I		Page No: 01 t	
Revision No : 0	on No : 00 Prepared By: V. KRANTHI KUMAR Approve BLACK BOARD, PPTs		
100IS: BLACK	BOARD, PPTs		
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I BEARI			
CO1: The stud	ent will able to select the suitable bearing base	d on the appl	ication of th
loads and predi	ct the life of the bearing.		
TB: "DESIGN	OF MACHINE ELEMENTS", V.B.BHANDARI, 3	rdEdition, Tata	McGraw Hi
<b>Education Privat</b>	te Limited publications.		
1	Classification of bearings	10/6/2019	
2	applications. types of journal bearings	12/6/2019	
3	lubrication — bearing modulus	12/6/2019	
4	full and partial — clearance ratio	13/6/2019	
5	clearance ratio, heat dissipation of bearings	15/6/2019	
6	bearing materials	15/6/2019	
7	Journal bearing	15/6/2019	Lecture
8	design of ball bearings	19/6/2019	intersperse
9	design of roller bearings	19/6/2019	with
10	static loading of ball bearings	19/6/2019	discussion
11	static loading of roller bearings	20/6/2019	
12	bearing life	22/6/2019	
13	problems	22/6/2019	
14	Problems on bearings	22/6/2019	
15	problems	24/6/2019	
16	problems	26/6/2019	
	ENGINE PARTS		
CO2: Able to de	esign the IC Engines parts.		
TB:"DESIGN O	F MACHINE ELEMENTS", V.B.BHANDARI, 3	Edition, Tata	McGraw Hi
17	e Limited publications.	1	
18	Connecting Rod  Thrust in connecting and	26/6/2019	
19	Thrust in connecting rod	27/6/2019	Lecture
19	stress due to whipping action on connecting rod	29/6/2019	intersperse
20	Problems on stress due to whipping action on	03/7/2019	with
21	connecting rod cranks and crank shafts	02/7/2010	discussion
22		03/7/2019	
23	strength and proportions of over hung cranks	03/7/2019	
	strength and proportions of over center cranks	06/7/2019	
24	crank pins, Crank shafts, Pistons, forces acting on piston	06/7/2019	

	acceptantian degion and proportions of	06/7/2019	
25	construction design and proportions of	00///2019	
23	piston,cylinder,Bore and length of cylinder		
	Thickness of cylinder wall, Stresses in cylinder	10/7/2019	
26	wall, Cylinder head,		
		10/7/2019	
27	Design of studs for cylinder	10///2019	
	head,problems,problems		
	Pistons, piston materials, Thickness of piston head	10/7/2019	
28	, piston ribs and cup, Piston rings , piston barrel,		
	skirt		
29	Piston pin, problems, problems	17/7/2019	
			Children 12

#### UNIT-III Design of curved beams

CO3: Able to design the curved beams, calculation of stresses in curved beams and expression for radius of neutral axis for curved beams with different cross-sections.

TB1: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill Education Private Limited publications.

TB2: "STRENGTH OF MATERIALS", Dr. R.K. BANSAL, 4th Edition,Laxmi Publications(P) Ltd.

30	Design of curved beams	20/7/2019	
31	Introduction, stresses in beams	24/7/2019	
32	Expression for radius of neutral axis rectangular section	25/7/2019	
33	Expression for radius of neutral axis circular section	27/7/2019	
34	Expression for radius of neutral axis trapezoidal section	27/7/2019	Lecture interspersed
35	Expression for radius of neutral axis t-section	27/7/2019	with
36	Design of crane hook	01/7/2019	discussions
37	Design of c- clamp	01/7/2019	
38	Problems on radius of neutral axis rectangular section, circular section, trapezoidal section, t-section	01/7/2019	
39	Problems on crane hook	03/7/2019	
40	Problems on c- clamp	03/8/2019	•

### UNIT-IV POWER TRANSMISSIONS SYSTENLS, PULLEYS

CO4: Able to design power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws.

TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3<sup>rd</sup>Edition, Tata McGraw Hill Education Private Limited publications.

41	Transmission of power by belt and drives transmission efficiencies	21/8/2019	
42	belts — flat and v types	21/8/2019	
43	ropes - pulleys for belt and rope drives	22/8/2019	
44	materials, chain drives	28/8/2019	Lecture
45	DESIGN OF POWER SCREWS : Design of screw	28/8/2019	interspersed with
46	square ACME, buttress screws, problems	28/8/2019	discussions
47	design of nut, compound screw	31/8/2019	
48	differential screw, ball screw	31/8/2019	
49	possible failures, Problems	31/8/2019	

### UNIT-V SPUR & HELICAL GEAR DRIVES

CO5: Able to design the spur & helical gear for different engineering applications.

TB:"DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rdEdition, Tata McGraw Hill

**Education Private Limited publications.** 

50	Spur gears- helical gears, load concentration	31/8/2019	
	factor, flange couplings		
51	Dynamic load factor, surface compressive strength — bending strength,	04/9/2019	Lecture
52			interspersed with
53	Module and face width, check for plastic creek for dynamic wear considerations, Problems	05/9/2019	discussions

### UNIT-VI MACHINE TOOL ELEMENTS

CO6: Able to design the Levers, brackets and Wire Ropes.

TB: "DESIGN OF MACHINE ELEMENTS", V.B.BHANDARI, 3rd Edition, Tata McGraw Hill

**Education Private Limited publications.** 

54	Levers and brackets: design of levers	12/9/2019	
55	hand lever — cranked lever	18/9/2019	
Mover of a	ever loaded safety valve- rocker arm straight	18/9/2019	Lecture
57	57 Angular design of a crank pin		interspersed with
58	58 Wire Ropes		discussions
59	Construction, Designation, Stresses in wire ropes	21/9/2019	discussions
60	sheaves and & drums	01/10/2019	

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## TENTETIVE LESSON PLAN - R1631034

Course Title: OF	PERATIONS RESEARCH	
Section: ME-A	Date: 10/06/2019	Page No: 01 of 03
Revision No: 00	Prepared By: V.PRASANTHI	Approved By : HOD

Tools	•	Bl	ack	bo	ard
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No. of	TOPIC	Date	Mode of
Periods			Delivery

#### UNIT- I: DEVELOPMENT OF OR & ALLOCATION

CO1: To understand the need of using OR – a quantitative approach for effective decision making, know various definitions of OR, its characteristics and various phases of scientific study. To gain knowledge of situations in which LPP can be applied and understand fundamental concepts and able to solve LPP by using different methods.

### TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

1.	Development of OR – definition	10-6-2019	
2.	characteristics and phases of OR	11-6-2019	
3.	OR models and applications.	12-6-2019	
4.	Linear programming problem formulation	13-6-2019	
	Linear programming problem formulation	14-6-2019	
5.	Col of I DD by graphical solution	15-6-2019	
	Sol.of LPP by graphical solution	17-6-2019	
6.		18-6-2019	Lecture
	Sol.of LPP by simplex method	19-6-2019	interspersed
		20-6-2019	with
7.		21-6-2019	discussions
	Sol.of LPP by Big-M method	22-6-2019	
		24-6-2019	
8.	Sol.of LPP by two-phase method	25-6-2019	
9.	Duality principle	26-6-2019	
10.	Problems-Revision	27-6-2019	

### UNIT- II: TRANSPORTATION PROBLEM & SEQUENCING

CO2: To recognize and formulate a transportation problem involving a large no. of shipping routes and Assignment problems. To derive initial basic feasible solution & optimal solution using several methods and able to solve travelling salesman problem.

## TB1: OPERATIONS RESEARCH By S.D. Sharma - Kedarnath.

11.	Introduction and Formulation of TP	28-6-2019	
12.	Sol.of TP by NWC rule	29-6-2019	
		1-7-2019	Lecture
13.	Sol.of TP by LCC method	2-7-2019	interspersed
		3-7-2019	with
14.	Sol.of TP by VAM	4-7-2019	discussions
		5-7-2019	
15.	Sol.of TP by UV method	6-7-2019	
		8-7-2019	
		9-7-2019	

	Unbalanced transportation problem –	10-7-2019
	degeneracy	11-7-2019
17.	Assignment problem – formulation	12-7-2019
18.	Optimal solution by Hungarian method	13-7-2019
19.	Traveling salesman problem	15-7-2019
20.	Introduction to flow –shop sequencing	16-7-2019
21.	n jobs through two machines, problems	17-7-2019
22.	<i>n</i> jobs through three machines, problems	18-7-2019
23.	Two jobs through 'm' machines, problems	19-7-2019
24.	Revision	20-7-2019

## UNIT III- REPLACEMENT THEORY

CO3: Be able to realize the need to study replacement policies & make distinctions among various types of failure.

# TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

25.	Introduction – replacement of items that deteriorate	22-7-2019	
	with time when money value is not counted	23-7-2019	
26.	Problems	24-7-2019	
		25-7-2019	
27.	Replacement of items that deteriorate with time	26-7-2019	Lecture
	when money value is counted	27-7-2019	interspersed
28.	Problems	29-7-2019	with
		30-7-2019	discussions
29.	replacement of items that fail completely, group	31-7-2019	
	replacement.	1-8-2019	
30.	Problems	2-8-2019	
	Tioning	3-8-2019	

### UNIT - IV THEORY OF GAMES & WAITING LINES

 ${
m CO4:}$  To understand how optimal strategies are formulated in conflict and competitive environment & apply various methods to select and execute various optimal strategies to win the game.

To understand distinction among several queuing models and derive performance measures for each of them.

TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

TB2: OPERATIONS RESEARCH Theory & Applications by J K Sharma.

31.	Introduction to game theory, Definations, Kendall's	13-8-2019	
	Notation	14-8-2019	
32.	mini. max (max. mini) – criterion	16-8-2019	
		17-8-2019	Lecture
33.	Rectangular games without saddle points – 2 x 2	19-8-219	interspersed
	games	20-8-2019	with
34.	Dominance principle	21-8-2019	discussions
35.	m x 2 games -graphical method.	22-8-2019	

2 games graphical method	24-8-2019
	26-8-2019
	27-8-2019
	28-8-2019
M/M/1:∞/FIFO model	29-8-2019
M/M/1:N/FIFO model	2, 0 2019
M/M/C·∞/FIFO model	30-8-2019
	2 x n games -graphical method.  Problems  Introduction to queueing theory  M/M/1:∞/FIFO model  M/M/C:∞/FIFO model

### UNIT -V INVENTORY

CO 5: To understand the meaning of inventory control, to use EOQ to minimize total inventory cost. Be able to use various selective control techniques to classify inventory items into broad categorie

TB1: OPERATIONS RESEARCH By S.D. Sharma - Kedarnath.

TB2: OPERATIONS RESEARCH Theory & Applications by J K Sharma.

WITTOT IS THE		
Introduction to Inventory conrol, Costs involved in		
	3-9-2019	
	4-9-2019	
EOQ Model without shortage, Problems	5-9-2019	
	6-9-2019	
EOQ Model without shortage, Problems	9-9-2019	Lecture
	9-9-2019	interspersed
EOQ Model without shortage, Problems	11-9-2019	with
EOO Model with shortages, Problems	12-9-2019	discussions
EOO Model with shortages, Problems	13-9-2019	
B. Assa inventory model with one price break	14-9-2019	
Purchase inventory model with one price breaks	16-9-2019	
Purchase inventory model with multiple price ordans		
Instantaneous demand, no set-up cost, Problems		
Uniform demand, no set-up cost, Problems	10-9-2019	
	Introduction to Inventory conrol, Costs involved in Inventory theory  EOQ Model without shortage, Problems  EOQ Model without shortage, Problems  EOQ Model without shortage, Problems  EOQ Model with shortages, Problems  EOQ Model with shortages, Problems  Purchase inventory model with one price break  Purchase inventory model with multiple price breaks  Instantaneous demand, no set-up cost, Problems  Uniform demand, no set-up cost, Problems	Introduction to Inventory conrol, Costs involved in Inventory theory  EOQ Model without shortage, Problems  EOQ Model with shortage, Problems  EOQ Model with shortages, Problems  12-9-2019  Purchase inventory model with one price break  Purchase inventory model with multiple price breaks  Instantaneous demand, no set-up cost, Problems

# **UNIT - VI : DYNAMIC PROGRAMMING & SIMULATION**

CO 6: To understand various dynamic programming models and their applications in solving a decision-problem. To apply Monte-Carlo simulation technique for solving various types of problems.

TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

TB2: OPERATIONS RESEARCH Theory & Applications by J K Sharma.

54.	Introduction - Bellman's principle of optimality	19-9-2019	
	Applications of dynamic programming	20-9-2019	Lecture
55.	Applications of dynamic programming	21-9-2019	interspersed
56.	Capital budgeting problem	23-9-2019	with
	Cl. 4 4 - 41 - mohlom	24-9-2019	discussions
57.	Shortest path problem	25-9-2019	_ Ciscussion
	r ' problem	26-9-2019	
58.	Linear programming problem.	27-9-2019	
59.	Problems	28-9-2019	
(0	Definition – types of simulation models	30-9-2019	
60.	Definition types of simulation	1-10-2019	
61.	Phases of simulation, applications of simulation		

62.	Advantages and disadvantages of simulation, Simulation languages	3-10-2019
63.	Inventory problems	4-10-2019
64.	Queuing problems	5-10-2019

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# TENTETIVE LESSON PLAN - R1631034

Course Title: OP	ERATIONS RESEARCH	
Section : ME-B	Date: 10/06/2019	Page No: 01 of 03
Revision No · 00	Prenared By · V PRASANTHI	Approved By: HOD

Cools: Black board				
No. of	TOPIC	Date	Mode of	
Pariods			Delivery	

### UNIT- I: DEVELOPMENT OF OR & ALLOCATION

CO1: To understand the need of using OR - a quantitative approach for effective decision making, know various definitions of OR, its characteristics and various phases of scientific study. To gain knowledge of situations in which LPP can be applied and understand fundamental concepts and able to solve LPP by using different methods.

## TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

1.	Development of OR – definition	10-6-2019	
2.	characteristics and phases of OR	11-6-2019	
3.	OR models and applications.	12-6-2019	
4.	Linear programming problem formulation	13-6-2019	
	Linear programming problem formulation	14-6-2019	
5.	G. 1 - GI DD by anathing a phytica	15-6-2019	
	Sol.of LPP by graphical solution	17-6-2019	
6.		18-6-2019	Lecture
	Sol.of LPP by simplex method	19-6-2019	interspersed
		20-6-2019	with
7.		21-6-2019	discussions
	Sol.of LPP by Big-M method	22-6-2019	ano ano ano
		24-6-2019	
8.	Sol.of LPP by two-phase method	25-6-2019	
9.	Duality principle	26-6-2019	
10.	Problems-Revision	27-6-2019	

## UNIT- II: TRANSPORTATION PROBLEM & SEQUENCING

CO2: To recognize and formulate a transportation problem involving a large no. of shipping routes and Assignment problems. To derive initial basic feasible solution & optimal solution using several methods and able to solve travelling salesman problem.

## TB1: OPERATIONS RESEARCH By S.D. Sharma - Kedarnath.

11.	Introduction and Formulation of TP	28-6-2019	
12.	Sol.of TP by NWC rule	29-6-2019	
		1-7-2019	Lecture
13.	Sol.of TP by LCC method	2-7-2019	interspersed
		3-7-2019	with
14.	Sol.of TP by VAM	4-7-2019	discussions
		5-7-2019	
15.	Sol.of TP by UV method	6-7-2019	
		8-7-2019	
		9-7-2019	

	Unbalanced transportation problem –	10-7-2019
	degeneracy	11-7-2019
17.	Assignment problem – formulation	12-7-2019
18.	Optimal solution by Hungarian method	13-7-2019
19.	Traveling salesman problem	15-7-2019
20.	Introduction to flow –shop sequencing	16-7-2019
21.	<i>n</i> jobs through two machines, problems	17-7-2019
22.	<i>n</i> jobs through three machines, problems	18-7-2019
23.	Two jobs through 'm' machines, problems	19-7-2019
24.	Revision	20-7-2019

### UNIT III- REPLACEMENT THEORY

CO3: Be able to realize the need to study replacement policies & make distinctions among various types of failure.

## TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

25.	Introduction – replacement of items that deteriorate	22-7-2019	
	with time when money value is not counted	23-7-2019	
26.		24-7-2019	
	Problems	25-7-2019	
27.	Replacement of items that deteriorate with time	26-7-2019	Lecture
27.	when money value is counted	27-7-2019	interspersed
28.		29-7-2019	with
20.	Problems	30-7-2019	discussions
29.	replacement of items that fail completely, group	31-7-2019	
25.	replacement.	1-8-2019	
30.		2-8-2019	
30.	Problems	3-8-2019	

### UNIT - IV THEORY OF GAMES & WAITING LINES

CO4: To understand how optimal strategies are formulated in conflict and competitive environment & apply various methods to select and execute various optimal strategies to win the game.

To understand distinction among several queuing models and derive performance measures for each of them.

TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

TB2: OPERATIONS RESEARCH Theory & Applications by J K Sharma.

31.	Introduction to game theory, Definations, Kendall's	13-8-2019	
	Notation	14-8-2019	
32.	mini. max (max. mini) – criterion	16-8-2019	
		17-8-2019	Lecture
33.	Rectangular games without saddle points – 2 x 2	19-8-219	interspersed
	games	20-8-2019	with
34.	Dominance principle	21-8-2019	discussions
35.	m x 2 games -graphical method.	22-8-2019	

	2 x n games -graphical method.	24-8-2019
37.	Problems	26-8-2019
38.	Introduction to queueing theory	27-8-2019
39.	M/M/1:∞/FIFO model	28-8-2019
40.	M/M/1:N/FIFO model	29-8-2019
41.	M/M/C:∞/FIFO model	30-8-2019

### UNIT-V INVENTORY

CO 5: To understand the meaning of inventory control, to use EOQ to minimize total inventory cost. Be able to use various selective control techniques to classify inventory items into broad categorie

TB1: OPERATIONS RESEARCH By S.D. Sharma - Kedarnath.

TB2: OPERATIONS RESEARCH Theory & Applications by J K Sharma.

42	Introduction to Inventory conrol, Costs involved in	31-8-2019	
42.	Inventory theory	3-9-2019	
12	ECO Me del swith out about an Duchlama	4-9-2019	
43.	EOQ Model without shortage, Problems	5-9-2019	
44	ECO M. delevide out about an Ducklama	6-9-2019	
44.	EOQ Model without shortage, Problems	9-9-2019	Lecture
45	ECO M. d. l ith out shortens Broklams	9-9-2019	interspersed
45.	EOQ Model without shortage, Problems	11-9-2019	with
46.	EOQ Model with shortages, Problems	12-9-2019	discussions
47.	EOQ Model with shortages, Problems	13-9-2019	
48.	Purchase inventory model with one price break	14-9-2019	
49.	Purchase inventory model with multiple price breaks	16-9-2019	
50.	Instantaneous demand, no set-up cost, Problems	17-9-2019	
51.	Uniform demand, no set-up cost, Problems	18-9-2019	

### **UNIT - VI : DYNAMIC PROGRAMMING & SIMULATION**

CO 6: To understand various dynamic programming models and their applications in solving a decision-problem. To apply Monte-Carlo simulation technique for solving various types of problems.

TB1: OPERATIONS RESEARCH By S.D. Sharma – Kedarnath.

TB2: OPERATIONS RESEARCH Theory & Applications by J K Sharma.

54.	Introduction – Bellman's principle of optimality	19-9-2019	
55.	Applications of dynamic programming	20-9-2019	Lecture
56.	Capital budgeting problem	21-9-2019 23-9-2019	interspersed with
57.	Shortest path problem	24-9-2019 25-9-2019	discussions
58.	Linear programming problem.	26-9-2019 27-9-2019	
59.	Problems	28-9-2019	
60.	Definition – types of simulation models	30-9-2019	
61.	Phases of simulation, applications of simulation	1-10-2019	

62.	Advantages and disadvantages of simulation languages	lation, 3-10-2019
63.	Inventory problems	4-10-2019
64.	Queuing problems	5-10-2019

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# **TENTATIVE PLAN: R1631035**

	HERMAL ENGINEERING-II	Course code		
Section : Sec I			o: 01 to 03	
Revision No: 0		Approv	Approved By: HOD	
Tools: BLACK	BOARD			
No. of Periods	TOPIC	Date	Mode of Delivery	
UNIT-I	INTRODUCTION TO BASIC CONCEPTS			
CO1: Become f	amiliar with a basic concepts of Rankine cycle.			
TB: "THERMA	AL ENGINEERING-II", PAKIRAPPA.			
	UNIT-I-BASIC CONCEPTS			
1	Rankine cycle - schematic layout	11-06-2019		
2	thermodynamic analysis	12-06-2019		
3	Problems on Rankine cycle	14-06-2019		
4	concept of mean temperature of heat addition	15-06-2019		
5	methods to improve cycle performance	15-06-2019	1	
6	regeneration	15-06-2019	Lecture	
7	Problems on regeneration	18-06-2019	interspersed	
8	reheating	19-06-2019	with discussions	
9	Problems on reheating	21-06-2019	discussions	
10	combustion: fuels and combustion	22-06-2019		
11	concepts of heat of reaction	22-06-2019		
12	adiabatic flame temperature	22-06-2019		
12	Stoichiometry, flue gas analysis	25-06-2019		
13				
14 UNIT-II CO2: Understa poilers and dete	Problem BOILERS nd working of boilers including water tube, firmine efficiencies.	26-06-2019	nigh pressure	
14 UNIT-II CO2: Understa poilers and dete	Problem BOILERS  nd working of boilers including water tube, firmine efficiencies. LL ENGINEERING-II", PAKIRAPPA.	26-06-2019	nigh pressure	
14 UNIT-II CO2: Understa coilers and dete CB: "THERMA	Problem BOILERS  nd working of boilers including water tube, firmine efficiencies. L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS	26-06-2019 re tube and l	nigh pressure	
14 UNIT-II CO2: Understa poilers and dete	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  LL ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with	26-06-2019	nigh pressure	
14 UNIT-II CO2: Understa coilers and dete CB: "THERMA	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with	26-06-2019 re tube and I 28-06-2019	nigh pressure	
14 UNIT-II CO2: Understa coilers and dete CB: "THERMA  15 16	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches	26-06-2019 re tube and l 28-06-2019 29-06-2019 29-06-2019	nigh pressure	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17	Problem  BOILERS  Ind working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings—working principles	28-06-2019 28-06-2019 29-06-2019 29-06-2019		
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings—working principles  accessories—working principles  boiler horse power, equivalent evaporation,	26-06-2019 re tube and l 28-06-2019 29-06-2019 29-06-2019	Lecture interspersed	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17 18 19 20	Problem  BOILERS  Ind working of boilers including water tube, firmine efficiencies.  LENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency	28-06-2019 28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019	Lecture interspersed with	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance	28-06-2019 28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019	Lecture interspersed	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17  18 19 20 21	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and	28-06-2019 28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019	Lecture interspersed with	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17 18 19 20 21 22	Problem  BOILERS  Ind working of boilers including water tube, firmine efficiencies.  AL ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of	28-06-2019 28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019 06-07-2019	Lecture interspersed with	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17  18 19 20 21 22 23	BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of chimney	26-06-2019  re tube and l  28-06-2019  29-06-2019  29-06-2019  29-06-2019  05-07-2019  06-07-2019  06-07-2019  10-07-2019	Lecture interspersed with	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17 18 19 20 21 22 23 24	Problem  BOILERS  Ind working of boilers including water tube, firmine efficiencies.  LENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of chimney  Problem	28-06-2019 28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019 06-07-2019 06-07-2019	Lecture interspersed with	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17 18 19 20 21 22 23 24 25 NIT-III CO3: Analyze tl	BOILERS  Ind working of boilers including water tube, firmine efficiencies.  IL ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  Working principles of L.P & H.P boilers with sketches  Working principles of L.P & H.P boilers with sketches  Working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of chimney  Problem  STEAM NOZZLES & STEAM TURBINES  The flow of steam through nozzles	26-06-2019  re tube and l  28-06-2019  29-06-2019  29-06-2019  29-06-2019  05-07-2019  06-07-2019  06-07-2019  10-07-2019	Lecture interspersed with	
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17 18 19 20 21 22 23 24 25 NIT-III CO3: Analyze tl	BOILERS  Ind working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  Working principles of L.P & H.P boilers with sketches  Working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of chimney  Problem  STEAM NOZZLES & STEAM TURBINES	26-06-2019  re tube and l  28-06-2019  29-06-2019  29-06-2019  29-06-2019  05-07-2019  06-07-2019  06-07-2019  10-07-2019	Lecture interspersed with	

26	STEAM NOZZLES: Function of a nozzle –	16-07-2019	with
	applications - types,		discussions
27	flow through nozzles, thermodynamic analysis – assumptions	17-07-2019	
28	velocity of fluid at nozzle exit-Ideal and actual expansion in a nozzle	19-07-2019	
29		23-07-2019	
29	velocity coefficient, condition for maximum discharge	23-07-2019	
30	critical pressure ratio, criteria to decide nozzle	24-07-2019	
30	shape	24-07-2019	
31	Super saturated flow, its effects, degree of super	26-07-2019	
31	saturation	20-07-2019	
32	degree of under cooling - Wilson line	27-07-2019	
33	STEAM TURBINES: Classification – impulse	27-07-2019	
33	turbine; mechanical details	27-07-2019	
34	velocity diagram – effect of friction – power	27-07-2019	
5.	developed	27 07 2019	
35	axial thrust, blade or diagram efficiency –	30-07-2019	
33	condition for maximum efficiency	30 07 2019	
36	De-laval turbine - methods to reduce rotor speed-	02-08-2019	
37	velocity compounding, pressure compounding	03-08-2019	
3.	and velocity & pressure compounding	05 00 2015	
38	velocity and pressure variation along the flow –	03-08-2019	
	combined velocity diagram for a velocity		
	compounded impulse turbine, condition for		
	maximum efficiency		
B: "THERN	AAL ENGINEERING-II", PAKIRAPPA. UNIT-IV-REACTIONTURBINE & STEAM		
	CONDENSERS:		
39	REACTIONTURBINE: Mechanical details –	03-08-2019	
	principle of operation		
40	thermodynamic analysis of a stage, degree of reaction	16-08-2019	
41	velocity diagram – Parson's reaction turbine	17-08-2019	Lecture
42	condition for maximum efficiency	17-08-2019	interspersed
43	calculation of blade height	17-08-2019	with
44	STEAM CONDENSERS: Requirements of	20-08-2019	discussions
	steam condensing plant	20-00-2017	discussions
45	classification of condensers – working principle	21-08-2019	
13	of different types	21-00-2017	
46	vacuum efficiency and condenser efficiency – air	23-08-2019	
40	leakage, sources and its affects	25-00-2017	
47	air pump- cooling water requirement	24-08-2019	
48	problems	24-08-2019	
UNIT-V	GAS TURBINES	21 00 2019	
	te the performance of gas turbines.		
D: IREKW	AL ENGINEERING-II", PAKIRAPPA. UNIT-V- GAS TURBINES		
49	Simple gas turbine plant – ideal cycle	24-08-2019	
50	essential components	27-08-2019	Lecture
51	parameters of performance – actual cycle	28-08-2019	interspersed
			with
52	regeneration, inter cooling	30-08-2019	disquesions

reheating —closed and semi-closed cycles reheating —closed and semi-closed cycles

31-08-2019 31-08-2019 discussions

53

54

55	merits and demerits	31-08-2019
56	types of combustion chambers	04-09-2019
57	types of combustion chambers	13-09-2019
58	problems	18-09-2019
59	problems	21-09-2019
60	problems	21-09-2019

**UNIT-VI** JET PROPULSIONS & ROCKETS

CO6: Understand working of jet propulsions and rockets and related problems. TB: "THERMAL ENGINEERING-II", PAKIRAPPA.

	UNIT-VI- JET PROPULSIONS & ROCKETS		
61	<b>JET PROPULSIONS</b> -Principle of operation.	21-09-2019	
62	classification of jet propulsive engines	24-09-2019	
63	working principles with schematic diagrams and	25-09-2019	
	representation on t-s diagram		Lecture
64	thrust, thrust power and propulsion efficiency	27-09-2019	interspersed
65	problems	28-09-2019	with
66	turbo jet engines – needs and demands met by	28-09-2019	discussions
	turbo jet		
67	performance evaluation, thrust augmentation –	28-09-2019	
	methods		
68	Rockets: Application	01-10-2019	

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# **TENTATIVE PLAN: R1631035**

ection : Sec I	HERMAL ENGINEERING-II  Date: 11-06-2019	Page No: 01 to 03 Approved By: HOD	
Revision No : 00			
ools: BLACK		Approve	d by . HOD
No. of Periods	TOPIC	Date	Mode of Delivery
	INTRODUCTION TO BASIC CONCEPTS amiliar with a basic concepts of Rankine cycle.  AL ENGINEERING-II", PAKIRAPPA.		
1	UNIT-I-BASIC CONCEPTS	11.06.2010	
2	Rankine cycle - schematic layout	11-06-2019	
3	thermodynamic analysis	12-06-2019	
4	Problems on Rankine cycle	14-06-2019	
5	concept of mean temperature of heat addition	15-06-2019	
6	methods to improve cycle performance	15-06-2019	Lecture
7	regeneration	15-06-2019	interspersed
8	Problems on regeneration	18-06-2019	with
9	reheating	19-06-2019	discussions
10	Problems on reheating combustion:	21-06-2019	
11		22-06-2019	
12	concepts of heat of reaction	22-06-2019	
13	adiabatic flame temperature	22-06-2019	
	Stoichiometry, flue gas analysis	25-06-2019	
14 INIT-II IO2: Understa oilers and dete	Problem  BOILERS  nd working of boilers including water tube, fire rmine efficiencies.	26-06-2019 re tube and h	igh pressure
14 UNIT-II CO2: Understa oilers and dete	Problem BOILERS nd working of boilers including water tube, fire rmine efficiencies. LL ENGINEERING-II", PAKIRAPPA.		igh pressure
14 UNIT-II CO2: Understa oilers and dete 'B: "THERMA	Problem BOILERS nd working of boilers including water tube, firmine efficiencies. AL ENGINEERING-II", PAKIRAPPA. UNIT-II -BOILERS	re tube and h	igh pressure
14 UNIT-II CO2: Understa oilers and dete B: "THERMA	Problem BOILERS nd working of boilers including water tube, finermine efficiencies. L ENGINEERING-II", PAKIRAPPA. UNIT-II -BOILERS Classification	re tube and h	igh pressure
14 INIT-II CO2: Understa oilers and dete B: "THERMA  15 16	Problem  BOILERS  nd working of boilers including water tube, find the efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches	re tube and h	igh pressure
14 INIT-II CO2: Understa oilers and dete B: "THERMA	Problem  BOILERS  nd working of boilers including water tube, first time efficiencies.  LENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with	re tube and h	igh pressure
14 INIT-II CO2: Understa oilers and dete B: "THERMA  15 16	Problem  BOILERS  nd working of boilers including water tube, first time efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with	28-06-2019 29-06-2019	igh pressure
14 INIT-II CO2: Understa oilers and dete B: "THERMA  15 16	Problem  BOILERS  nd working of boilers including water tube, fire rmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches	28-06-2019 29-06-2019	igh pressure
14 INIT-II O2: Understa oilers and dete B: "THERMA  15 16 17	Problem  BOILERS  nd working of boilers including water tube, fire rmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings—working principles  accessories—working principles  boiler horse power, equivalent evaporation,	28-06-2019 29-06-2019 29-06-2019	
14 INIT-II CO2: Understa oilers and dete B: "THERMA  15 16 17 18 19	Problem  BOILERS  nd working of boilers including water tube, first time efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles	28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019	Lecture interspersed
14 INIT-II CO2: Understa oilers and dete B: "THERMA  15 16 17 18 19 20	Problem  BOILERS  nd working of boilers including water tube, fire rmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance	28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019	Lecture interspersed with
14 INIT-II IO2: Understa oilers and dete B: "THERMA  15 16 17  18 19 20	Problem  BOILERS  nd working of boilers including water tube, fire remine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and	28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019	Lecture interspersed with
14 INIT-II CO2: Understa oilers and dete B: "THERMA  15 16 17 18 19 20 21 22	Problem  BOILERS  nd working of boilers including water tube, firemine efficiencies.  LENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of	28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019 06-07-2019	Lecture interspersed with
14 UNIT-II CO2: Understa oilers and dete B: "THERMA  15 16 17 18 19 20 21 22 23	Problem  BOILERS  nd working of boilers including water tube, fire remine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge	28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019 06-07-2019 06-07-2019	Lecture interspersed with
14 UNIT-II CO2: Understa coilers and dete B: "THERMA  15 16 17 18 19 20 21 22 23 24 25 UNIT-III CO3: Analyze the	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of chimney  Problem  STEAM NOZZLES & STEAM TURBINES  he flow of steam through nozzles	28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 05-07-2019 06-07-2019 06-07-2019 10-07-2019	Lecture interspersed with
14 INIT-II CO2: Understa oilers and dete B: "THERMA  15 16 17 18 19 20 21 22 23 24 25 INIT-III CO3: Analyze the	Problem  BOILERS  nd working of boilers including water tube, firmine efficiencies.  L ENGINEERING-II", PAKIRAPPA.  UNIT-II -BOILERS  Classification  working principles of L.P & H.P boilers with sketches  working principles of L.P & H.P boilers with sketches  mountings— working principles  accessories— working principles  boiler horse power, equivalent evaporation, efficiency  heat balance  draught, classification  height of chimney for given draught and discharge  condition for maximum discharge, efficiency of chimney  Problem  STEAM NOZZLES & STEAM TURBINES	28-06-2019 29-06-2019 29-06-2019 29-06-2019 03-07-2019 06-07-2019 06-07-2019 06-07-2019	Lecture interspersed with

26	STEAM NOZZLES: Function of a nozzle –	16-07-2019	with
27	applications - types, flow through nozzles, thermodynamic analysis –		discussions
	assumptions	17-07-2019	
28	velocity of fluid at nozzle exit-Ideal and actual	19-07-2019	
	expansion in a nozzle	19-07-2019	
29	velocity coefficient, condition for maximum	23-07-2019	
	discharge	25 07-2017	
30	critical pressure ratio, criteria to decide nozzle	24-07-2019	
	shape		
31	Super saturated flow, its effects, degree of super	26-07-2019	
	saturation		
32	degree of under cooling - Wilson line	27-07-2019	
33	STEAM TURBINES: Classification – impulse	27-07-2019	
24	turbine; mechanical details		
34	velocity diagram - effect of friction - power	27-07-2019	
35	developed		
33	axial thrust, blade or diagram efficiency –	30-07-2019	
36	condition for maximum efficiency		
37	De-laval turbine - methods to reduce rotor speed-	02-08-2019	
37	velocity compounding, pressure compounding	03-08-2019	
38	and velocity & pressure compounding		
30	velocity and pressure variation along the flow – combined velocity diagram for a velocity	03-08-2019	
	compounded impulse turbine, condition for		
	maximum efficiency		
UNIT-IV	REACTIONTURBINE & STEAM CONDENSE	EDC	
CO4: Evaluat	e the performance of condensers and steam turbine	LKS	
TB: "THERM	IAL ENGINEERING-II", PAKIRAPPA.	es.	
	UNIT-IV-REACTIONTURBINE & STEAM		
	CONDENSERS:		
39	REACTIONTURBINE: Mechanical details –	03-08-2019	
	principle of operation	03-00-2017	
40	thermodynamic analysis of a stage, degree of	16-08-2019	
	reaction	10 00 2019	
41	velocity diagram - Parson's reaction turbine	17-08-2019	Lecture
42	condition for maximum efficiency	17-08-2019	interspersed
43	calculation of blade height	17-08-2019	with
44	STEAM CONDENSERS: Requirements of	20-08-2019	discussions
	steam condensing plant		
45	classification of condensers – working principle	21-08-2019	
16	of different types		
46	vacuum efficiency and condenser efficiency – air	23-08-2019	
47	leakage, sources and its affects		
47	air pump- cooling water requirement	24-08-2019	
48 UNIT V	problems	24-08-2019	
	GAS TURBINES		
COS: Evaluate	the performance of gas turbines.		
B: "THERMA	L ENGINEERING-II", PAKIRAPPA.		

	UNIT-V- GAS TURBINES		
49	Simple gas turbine plant – ideal cycle	24-08-2019	
50	essential components	27-08-2019	Lecture
51	parameters of performance – actual cycle	28-08-2019	interspersed
52	regeneration, inter cooling	30-08-2019	with
53	reheating -closed and semi-closed cycles	31-08-2019	discussions
54	reheating –closed and semi-closed cycles	31-08-2019	

55	merits and demerits	31-08-2019
56	types of combustion chambers	04-09-2019
57	types of combustion chambers	13-09-2019
58	problems	18-09-2019
59	problems	21-09-2019
60	problems	21-09-2019

UNIT-VI JET PROPULSIONS & ROCKETS

CO6: Understand working of jet propulsions and rockets and related problems.

TB: "THERMAL ENGINEERING-II", PAKIRAPPA.

	UNIT-VI- JET PROPULSIONS & ROCKETS		
61	<b>JET PROPULSIONS</b> -Principle of operation.	21-09-2019	
62	classification of jet propulsive engines	24-09-2019	
63	working principles with schematic diagrams and	25-09-2019	
	representation on t-s diagram		Lecture
64	thrust, thrust power and propulsion efficiency	27-09-2019	interspersed
65	problems	28-09-2019	with
66	turbo jet engines – needs and demands met by turbo jet	28-09-2019	discussions
67	performance evaluation, thrust augmentation — methods	28-09-2019	
68	Rockets : Application	01-10-2019	

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### TENTATIVE LESSON PLAN

Course Title: MECHATRONICS Cours		Course Code: R1641031	
Section : Sec A	Date: 11/6/2019	Page No: 01 of 03	
Revision No: 00	Prepared By: A.STANLY KUMA	AR Approved By: HOD	

Tools: Black board, PPTs

No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-I	INTRODUCTION TO MECHATRONICS SYST	TEMS	
CO1: Ab	le to UNNDERSTAND BASICS OF MECHATRONI	ics.	
TTB: M	echatronics Integrated Mechacal Electronics System	s,K.P.Ramacha	ndran
G	.K.Vijayaraghavan,M.S.Balasundaram/Wiley India		
1	INTRODUCTION Mechatronics	<b>20</b> 19/6/201	
		9	
2	Mechatronics.	19/6/2019	
3	Elements & levels of mechatronics system,	20/6/2019	
4	Mechatronics design process, system	21/6/2019	
5	Measurement systems, control systems	22/6/2019	
6	Microprocessor-based controllers	23/6/2019	Lecture
7	Systems advantages, and disadvantages of mechatronics systems	24/6/2019	interspersed
8	Sensors and transducers, types,	25/6/2019	with
9	Displacement, position, proximity, velocity	26/6/2019	discussions
10	Motion, force, acceleration, torque, fluid pressure,	27/6/2019	
11	Liquid flow, liquid level, temperature, and light sensors.	28/6/2019	
12	Revision	29/6/2019	
No. of	TOPIC	Date	Mode o
Periods			Delivery
UNIT-II	SOLID STATE ELECTERONIC DEVICES		
CO1: Ab	le to SOLID STATE ELECTERONIC DEVICES T	ГВ: Mechatroni	cs Integrated

CO1: Able to SOLID STATE ELECTERONIC DEVICES T TB: Mechatronics Integrated

iley India				
30/6/2019				
duction,				
1/7/2019				
2/7/2019				
3/7/2019				
4/7/2019				
5/7/2019				
6/7/2019	Lecture			
7/7/2019	interspersed			
8/7/2019	with			
9/7/2019	discussions			
duction, 10/7/2019				
11/7/2019				
12/7/2019				
Date	Mode of			
	Delivery			
UNIT-III HYDRAULIC AND PNEUMATIC ACTUATING SYSTEMS				
CTUATING SYSTEMS				
CTUATING SYSTEMS CTUATING SYSTEMS				
	dran			
CTUATING SYSTEMS cs Systems,K.P.Ramachan iley India	dran			
CTUATING SYSTEMS cs Systems,K.P.Ramachan	dran			
CTUATING SYSTEMS cs Systems,K.P.Ramachan iley India	dran			
cs Systems,K.P.Ramachaneiley India	dran Lecture			
cs Systems,K.P.Ramachandiley India  13/7/2019  ems –				
cruating systems cs Systems,K.P.Ramachane iley India  13/7/2019 ems –  14/7/2019	Lecture			
	1/7/2019 2/7/2019 3/7/2019 4/7/2019 5/7/2019 6/7/2019 7/7/2019 8/7/2019 9/7/2019 11/7/2019 11/7/2019			

6	Hydro-pneumatic,	18/7/2019	
7	Electro-hydraulic servo systems.	19/7/2019	
8	Mechanical actuating systems and electrical actuating systems	20/7/2019	-
9	Basic principles and elements.	21/7/2019	
10		22/7/2019	
	Hydraulic and pneumatic actuating systems – Fluid systems,		
11	Hydraulic systems,	23/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-IV	Digital electronics and systems.		
CO1: Ab	ole to Digital electronics and systems.		
T TB: M	echatronics Integrated Mechacal Electronics System	ıs,K.P.Ramacha	ndran
G	.K.Vijayaraghavan,M.S.Balasundaram/Wiley India		
1	UNIT-IV	24/7/2019	
	Digital electronics and systems.		
2	Digital logic control	25/7/2019	
3	Micro controllers	26/7/2019	Lecture
4	Microprocessors and, programming	27/7/2019	interspersed
5	Process controllers	28/7/2019	with
6	Programmable logic controllers,	29/7/2019	discussions
7	PLCs versus computers	30/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-V	System and interfacing and data acquisition		
CO1: Ab	le to UNNDERSTAND System and interfacing and	d data acquisit	ion
T TB: Mo	echatronics Integrated Mechacal Electronics System	s,K.P.Ramachai	ndran
G	.K.Vijayaraghavan,M.S.Balasundaram/Wiley India		
1		1/8/2019	
	System and interfacing and data acquisition.		

Periods			Delivery
No. of	TOPIC	Date	Mode of
7	Interfacing motor drives	7/8/2019	
6	Typical layouts	6/8/2019	discussions
5	Data flow in DSPs, block diagrams	5/8/2019	with
4	Digital Signal Processing	4/8/2019	interspersed
3	Analog to Digital and Digital to Analog conversions.	3/8/2019	Lecture
2	Data Acquisition Systems	2/8/2019	

**UNIT-VI** Dynamic models and analogies.

CO1: Able to Dynamic models and analogies.

T TB: Mechatronics Integrated Mechacal Electronics Systems, K.P. Ramachandran G.K.Vijayaraghavan, M.S.Balasundaram/Wiley India

1	Dynamic models and analogies.	8/8/2019	
2	System response	9/8/2019	
3	Process Controllers	10/8/2019	
4	Digital Controllers	11/8/2019	Lecture
5	Programmable Logic Controllers,	12/8/2019	interspersed
6	Design of mechatronics systems	13/8/2019	with
7	Future trends.	14/8/2019	discussions
8	Revision	15/8/2019	

Signature of Faculty
Date:

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#### TENTATIVE LESSON PLAN

Course Title: MECHATRONICS Course C		Course Code: R1641031
Section : Sec B	Date: 11/6/2019	Page No: 01 of 03
Revision No: 00	Prepared By: A.STANLY KUMA	R Approved By: HOD

No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-I	INTRODUCTION TO MECHATRONICS SYST	TEMS	
CO1: Ab	le to UNNDERSTAND BASICS OF MECHATRON	ICS.	
T TB: M	lechatronics Integrated Mechacal Electronics System	s,K.P.Ramacha	ndran
G	K.K.Vijayaraghavan,M.S.Balasundaram/Wiley India		
1	INTRODUCTION Mechatronics	<b>19/6/201</b>	
		9	
2	Mechatronics.	19/6/2019	
3	Elements & levels of mechatronics system,	20/6/2019	
4	Mechatronics design process, system	21/6/2019	
5	Measurement systems, control systems	22/6/2019	
6	Microprocessor-based controllers	23/6/2019	Lecture
7	Systems advantages, and disadvantages of mechatronics systems	24/6/2019	interspersed
8	Sensors and transducers, types,	25/6/2019	with
9	Displacement, position, proximity, velocity	26/6/2019	discussions
10	Motion, force, acceleration, torque, fluid pressure,	27/6/2019	
11	Liquid flow, liquid level, temperature, and light sensors.	28/6/2019	
12	Revision	29/6/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery

CO2: Able to SOLID STATE ELECTERONIC DEVICES

TB: Mechatronics Integrated Mechacal Electronics Systems, K.P. Ramachandran

G	.K.Vijayaraghavan,M.S.Balasundaram/Wiley India		
1	UNIT-II  Solid state electronic devices, noise reduction, filtering.	30/6/2019	
2	PN junction diode	1/7/2019	
3	BJT	2/7/2019	
4	FET	3/7/2019	
5	DIAC	4/7/2019	
6	TRIAC and LEDs	5/7/2019	
7	Analog signal conditioning	6/7/2019	Lecture
8	Operational amplifiers	7/7/2019	interspersed
9	Operational amplifiers,	8/7/2019	with
10	Noise reduction,	9/7/2019	discussions
11	Solid state electronic devices, noise reduction, filtering.	10/7/2019	
12	PN junction diode	11/7/2019	
13	BJT	12/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
T TB: Me	le to HYDRAULIC AND PNEUMATIC ACTUATING echatronics Integrated Mechacal Electronics Systems, .K.Vijayaraghavan, M.S.Balasundaram/Wiley India	G SYSTEMS ,K.P.Ramachar	ndran
1	UNIT-III  Hydraulic and pneumatic actuating systems – Fluid systems,	13/7/2019	
2	Hydraulic systems,	14/7/2019	Lecture
3	Pneumatic systems	15/7/2019	interspersed
4	Components	16/7/2019	with
5	Electro-pneumatic	17/7/2019	discussions
6	Hydro-pneumatic,	18/7/2019	

7	Electro-hydraulic servo systems.	19/7/2019	
8	Mechanical actuating systems and electrical actuating systems	20/7/2019	
9	Basic principles and elements.	21/7/2019	
10		22/7/2019	
	Hydraulic and pneumatic actuating systems – Fluid systems,		
11	Hydraulic systems,	23/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-IV	Digital electronics and systems.		
CO4: Ab	ole to Digital electronics and systems.		
T TB: M	echatronics Integrated Mechacal Electronics Systems	,K.P.Ramacha	ndran
G	.K.Vijayaraghavan,M.S.Balasundaram/Wiley India		
1	UNIT-IV	24/7/2019	
	Digital electronics and systems.		
2	Digital logic control	25/7/2019	
3	Micro controllers	26/7/2019	Lecture
4	Microprocessors and, programming	27/7/2019	interspersed
5	Process controllers	28/7/2019	with
6	Programmable logic controllers,	29/7/2019	discussions
7	PLCs versus computers	30/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-V	System and interfacing and data acquisition		
CO5: Ab	le to UNNDERSTAND System and interfacing and	data acquisit	on
T TB: Me	echatronics Integrated Mechacal Electronics Systems	K.P.Ramachar	ıdran
G	.K.Vijayaraghavan,M.S.Balasundaram/Wiley India		
1		1/8/2019	
	System and interfacing and data acquisition.		
2	Data Acquisition Systems	2/8/2019	Lecture

25	Hydro-pneumatic,	TB1
26	Electro-hydraulic servo systems.	TB1
26	Mechanical actuating systems and electrical actuating systems	TB1
28	Basic principles and elements.	TB1
UNIT- 4	UNIT-IV Digital electronics and systems.	TB1
29	Digital logic control	TB1
30	Micro controllers	TB1
31	Microprocessors and, programming	TB1
32	Process controllers	TB1
33	Programmable logic controllers,	TB1
34	PLCs versus computers	TB1
35	Application of PLCs for control.	TB1
UNIT- 5	UNIT-V System and interfacing and data acquisition.	TB1
36	Data Acquisition Systems	TB1
37	Analog to Digital and Digital to Analog conversions.	TB1
38	Digital Signal Processing	TB1
39	Data flow in DSPs, block diagrams	TB1
40	Typical layouts	TB1
41	Interfacing motor drives	TB1
UNIT- 6	Dynamic models and analogies.	TB2
24	System response	TB2
25	Process Controllers	TB2
26	Digital Controllers	TB1
27	Programmable Logic Controllers,	TB2
28	Design of mechatronics systems	TB1
29	Future trends.	TB2

TB1: Mechatronics Integrated Mechacal Electronics Systems, K.P. Ramachandran

G.K.Vijayaraghavan,M.S.Balasundaram/Wiley India

Signature of Faculty

Date:

19/6/19

Signature of HOD

Date: jale 19

Periods			Delivery
No. of	TOPIC	Date	Mode of
7	Interfacing motor drives	7/8/2019	
6	Typical layouts	6/8/2019	
5	Data flow in DSPs, block diagrams	5/8/2019	discussions
4	Digital Signal Processing	4/8/2019	with
3	Analog to Digital and Digital to Analog conversions.	3/8/2019	interspersed

Dynamic models and analogies. **UNIT-VI** 

CO6: Able to Dynamic models and analogies.

T TB: Mechatronics Integrated Mechacal Electronics Systems, K.P. Ramachandran G.K.Vijayaraghavan, M.S.Balasundaram/Wiley India

1	Dynamic models and analogies.	8/8/2019	
2	System response	9/8/2019	
3	Process Controllers	10/8/2019	
4	Digital Controllers	11/8/2019	Lecture
5	Programmable Logic Controllers,	12/8/2019	interspersed
6	Design of mechatronics systems	13/8/2019	with
7	Future trends.	14/8/2019	discussions
8	Revision	15/8/2019	

Signature of Faculty
Date:

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#### TENTATIVE LESSON PLAN

Course Title: CAD / CAM Course		Course Code: R1641032
Section : Sec A	Date: 11/6/2019	Page No: 01 of 03
Revision No: 00	Prepared By: R SAMBATH KU	MAR Approved By : HOD

Tools: Black board, PPTs

No. of	TOPIC	Date	Mode of
Periods			Delivery
	INTRODUCTION CAD CAM ble to UNNDERSTAND CAD CAM BASIC BRAHIM ZAHEED CAD CAM THEORY	ü	
1	CAD CAM BASIC	18/6/2019	
2	Computers in industrial manufacturing, product cycle	19/6/2019	
3	CAD / CAM Hardware	20/6/2019	
4	basic structure, CPU	21/6/2019	
5	memory types, input devices	22/6/2019	
6	display devices, hard copy devices	23/6/2019	Lecture
7	Raster scan graphics coordinate system	24/6/2019	interspersed
8	database structure for graphics modeling	25/6/2019	with discussions
9	transformation of geometry	26/6/2019	discussions
10	3D transformations, mathematics of projections	27/6/2019	
11	clipping	28/6/2019	
12	hidden surface removal	29/6/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
	GEOMETRIC MODELLING/DRAFTING AND ble to UNNDERSTAND GEOMETRIC MODLLING RINCIPLES CAD CAM BY PEARSON		
1	geometric modeling: Requirements	30/6/2019	
2	geometric models	1/7/2019	
3	geometric construction models	2/7/2019	Lecture
4	curve representation methods	3/7/2019	interspersed
5	surface representation methods	4/7/2019	with
6	Modeling facilities desired.	5/7/2019	discussions
7	Basic geometric commands	6/7/2019	

6	Computer aided processes planning importance	29/7/2019	aiscussions
3	Computer aided processes planning	28/7/2019	discussions
5	types and advantages  Computer aided processes planning	27/7/2019	with
4	production flow analysis	26/7/2019	interspersed
3	coding and classification	25/7/2019	Lecture
2		24/7/2019	
	group technology: Part family	24/7/2010	
CO1: Ab	ole to UNNDERSTAND group technology		
UNIT-IV	GROUP TECHNOLOGY		Delivery
Periods		Date	
No. of	TOPIC	Date	Mode of
11	turning center	23/7/2019	
10	CNC machine tools	22/7/2019	
9	Adaptive Control	21/7/2019	
8	Direct Numerical Control	20/7/2019	discussions
7	Computer Aided Part Programming	19/7/2019	with
	part programming methods	9	interspersed
6	manual part programming methods	2019/7/201	Lecture
5	CNC Part Programming	17/7/2019	
4	features of Machining center	16/7/2019	
3	structure of CNC machine tools	15/7/2019	
2	NC elements	14/7/2019	
1 TB: II	RAHIM ZAHEED CAD CAM THEORY  NC, NC modes	13/7/2019	
CO1: Al	ole to UNNDERSTAND PROGRAMMING		
UNIT-II	I PART PROGRAMMING		Delivery
Periods	10110	Date	Delivery
No. of	TOPIC	12/7/2019 Date	Mode of
13	solid modeling	11/7/2019	
12	Solid modelling	10/7/2019	
11	editing dimensioning	9/7/2019	
10	display control commands	8/7/2019	
9	layers	7/7/2019	

UNIT-V computer aided quality control CO1: Able to UNNDERSTAND computer aided quality control T TB: product manufacturing by chang  1 computer aided quality control 2 Terminology used in quality control 3 use of computers in Quality control 4 Inspection methods 5 contact and noncontact types 5 contact and noncontact types 6 computer aided testing 7 integration of CAQC with CAD/CAM No. of TOPIC Date Mode of Periods T TB: cnc and programming by thomson 1 Types of manufacturing systems 2 material handling systems 4 material requirement planning 5 computer control systems 6 human labor in manufacturing systems 11/8/2019 11/8/2019 11/8/2019 11/8/2019 11/8/2019 11/8/2019 11/8/2019	7	Computer aided processes planning types	30/7/2019	
UNIT-V computer aided quality control CO1: Able to UNNDERSTAND computer aided quality control TTB: product manufacturing by chang  1 computer aided quality control 2 Terminology used in quality control 3 use of computers in Quality control 4 Inspection methods 5 contact and noncontact types 6 computer aided testing 7 integration of CAQC with CAD/CAM 7/8/2019 No. of TOPIC Date Mode of Periods TTB: cnc and programming by thomson 1 Types of manufacturing systems 4 material requirement planning 5 computer control systems 6 human labor in manufacturing systems 7 CIMS benefits 11/8/2019 11/8/2019 12/8/2019 13/8/2019 14/8/2019 15/8/2019 16/8/2019 17/8/2019 18/8/2019 18/8/2019 18/8/2019 18/8/2019 18/8/2019 18/8/2019 18/8/2019 18/8/2019 18/8/2019	No. of	TOPIC	Date	Mode of
CO1: Able to UNNDERSTAND computer aided quality control TTB: product manufacturing by chang  1 computer aided quality control 2/8/2019 2 Terminology used in quality control 3/8/2019 3 use of computers in Quality control 4 Inspection methods 5 contact and noncontact types 6 computer aided testing 7 integration of CAQC with CAD/CAM 7/8/2019 No. of TOPIC Date Mode of Periods UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM TTB: cnc and programming by thomson 1 Types of manufacturing systems 2 machine tools and related equipment 3 material handling systems 4 material requirement planning 5 computer control systems 6 human labor in manufacturing systems 12/8/2019 6 human labor in manufacturing systems 12/8/2019 7 CIMS benefits 14/8/2019	Periods			Delivery
1 computer aided quality control 2 Terminology used in quality control 2 use of computers in Quality control 3 use of computers in Quality control 4 Inspection methods 5 contact and noncontact types 5 contact and noncontact types 6 computer aided testing 7 integration of CAQC with CAD/CAM 7/8/2019  No. of TOPIC Date Mode of Delivery  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM TTB: cnc and programming by thomson 1 Types of manufacturing systems 2 machine tools and related equipment 9/8/2019 3 material handling systems 4 material requirement planning 5 computer control systems 6 human labor in manufacturing systems 11/8/2019 6 human labor in manufacturing systems 12/8/2019 7 CIMS benefits 11/8/2019	CO1: At	ole to UNNDERSTAND computer aided quality cont	rol	
3 use of computers in Quality control  4 Inspection methods  5 contact and noncontact types  6 computer aided testing  7 integration of CAQC with CAD/CAM  No. of  Periods  TOPIC  Date  Mode of Periods  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM T TB: cnc and programming by thomson  1 Types of manufacturing systems  2 machine tools and related equipment  3 material handling systems  4 material requirement planning  5 computer control systems  6 human labor in manufacturing systems  1 1/8/2019  6 human labor in manufacturing systems  1 1/8/2019  7 CIMS benefits  1 1/8/2019	A		1/8/2019	
4 Inspection methods 5 contact and noncontact types 6 computer aided testing 7 integration of CAQC with CAD/CAM 7/8/2019  No. of TOPIC Date Mode of Periods  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM TB: cnc and programming by thomson 1 Types of manufacturing systems 8/8/2019 2 machine tools and related equipment 9/8/2019 3 material handling systems 4 material requirement planning 10/8/2019 4 material requirement planning 5 computer control systems 6 human labor in manufacturing systems 7 CIMS benefits 11/8/2019 11/8/2019 11/8/2019 11/8/2019 11/8/2019	2	Terminology used in quality control	2/8/2019	
5 contact and noncontact types  6 computer aided testing  7 integration of CAQC with CAD/CAM  No. of  TOPIC  Date  Mode of  Periods  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM COI: Able to UNNDERSTAND CIM SYSTEM TB: cnc and programming by thomson  1 Types of manufacturing systems  2 machine tools and related equipment 9/8/2019 3 material handling systems 4 material requirement planning 11/8/2019 5 computer control systems 6 human labor in manufacturing systems 7 CIMS benefits 13/8/2019  14/8/2019  15/8/2019  16 human labor in manufacturing systems 13/8/2019  14/8/2019	3	use of computers in Quality control	3/8/2019	Lecture
6 computer aided testing 7 integration of CAQC with CAD/CAM 7/8/2019  No. of TOPIC Date Mode of Delivery  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM T TB: cnc and programming by thomson  1 Types of manufacturing systems 8/8/2019 2 machine tools and related equipment 9/8/2019 3 material handling systems 10/8/2019 4 material requirement planning 11/8/2019 5 computer control systems 12/8/2019 6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019	4	Inspection methods	4/8/2019	interspersed
7 integration of CAQC with CAD/CAM  No. of Periods  TOPIC  Date Mode of Delivery  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM T TB: cnc and programming by thomson  1 Types of manufacturing systems 8/8/2019 2 machine tools and related equipment 9/8/2019 3 material handling systems 10/8/2019 4 material requirement planning 11/8/2019 5 computer control systems 12/8/2019 6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019	5	contact and noncontact types	5/8/2019	with
No. of Periods TOPIC Date Mode of Delivery  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM TB: cnc and programming by thomson  1 Types of manufacturing systems 8/8/2019 2 machine tools and related equipment 9/8/2019 3 material handling systems 10/8/2019 4 material requirement planning 11/8/2019 5 computer control systems 12/8/2019 6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019	6	computer aided testing	6/8/2019	discussions
Periods  UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM T TB: cnc and programming by thomson  1 Types of manufacturing systems 8/8/2019 2 machine tools and related equipment 9/8/2019 3 material handling systems 10/8/2019 4 material requirement planning 11/8/2019 5 computer control systems 12/8/2019 6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019	7	integration of CAQC with CAD/CAM	7/8/2019	
UNIT-VI COMPUTER INTEGRATED MANUFACTURING SYSTEM CO1: Able to UNNDERSTAND CIM SYSTEM T TB: cnc and programming by thomson  1 Types of manufacturing systems 8/8/2019 2 machine tools and related equipment 9/8/2019 3 material handling systems 10/8/2019 4 material requirement planning 11/8/2019 5 computer control systems 12/8/2019 6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019		MODIC	<b>D</b>	37 1 0
CO1: Able to UNNDERSTAND CIM SYSTEM T TB: cnc and programming by thomson  1    Types of manufacturing systems	No. of	TOPIC	Date	Mode of
Types of manufacturing systems  machine tools and related equipment  material handling systems  material requirement planning  computer control systems  human labor in manufacturing systems  CIMS benefits  8/8/2019  10/8/2019  Lecture interspersed with discussions		TOPIC	Date	
3 material handling systems 4 material requirement planning 5 computer control systems 6 human labor in manufacturing systems 7 CIMS benefits 10/8/2019 Lecture interspersed with discussions	Periods UNIT-V	I COMPUTER INTEGRATED MANUFACTURE COLUMN SYSTEM		Delivery
4 material requirement planning 5 computer control systems 6 human labor in manufacturing systems 7 CIMS benefits Lecture interspersed with discussions	Periods UNIT-V CO1: At	I COMPUTER INTEGRATED MANUFACTURATED TO THE COMPUTER OF THE CO	RING SYSTEM	Delivery
4 material requirement planning 11/8/2019 5 computer control systems 12/8/2019 6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019	Periods UNIT-V. CO1: At T TB: cn	I COMPUTER INTEGRATED MANUFACTURATE TO THE COMPUTER OF THE COM	8/8/2019	Delivery
5 computer control systems 12/8/2019 6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019 discussions	Periods UNIT-V CO1: At T TB: cr	COMPUTER INTEGRATED MANUFACTURATE OF COMPUTER INTEGRATED OF COMPUTER INTEGRATE	8/8/2019 9/8/2019	Delivery
6 human labor in manufacturing systems 13/8/2019 7 CIMS benefits 14/8/2019 discussions	Periods UNIT-V CO1: At TTB: cr	COMPUTER INTEGRATED MANUFACTURAL	8/8/2019 9/8/2019 10/8/2019	Delivery  1 Lecture
7 CIMS benefits 14/8/2019	Periods UNIT-V CO1: At TTB: cm 1 2 3 4	COMPUTER INTEGRATED MANUFACTURAL	8/8/2019 9/8/2019 10/8/2019 11/8/2019	Delivery  1 Lecture interspersed
8 Revision 15/8/2019	Periods UNIT-V CO1: At TTB: cr 1 2 3 4	COMPUTER INTEGRATED MANUFACTURAL	8/8/2019 9/8/2019 10/8/2019 11/8/2019 12/8/2019	Delivery  Lecture interspersed with
	Periods UNIT-V CO1: At TTB: cr 1 2 3 4 5	COMPUTER INTEGRATED MANUFACTURATE OF THE COMPUTER INTEGRATED MANUFACTURATE OF THE COMPUTER SYSTEM OF THE COMPUTER SYSTEM OF THE COMPUTER SYSTEMS  Types of manufacturing systems  machine tools and related equipment  material handling systems  material requirement planning  computer control systems  human labor in manufacturing systems	8/8/2019 9/8/2019 10/8/2019 11/8/2019 12/8/2019 13/8/2019	Delivery  1 Lecture interspersed

In January
Signature of Faculty

Date: 11.6.2019

PRINCIPAL SRK Institute of Technology ENIKEPADU, VIJAYAWADA-521 108 Signature of HOD

Date: 11.6.2019

#### TENTATIVE LESSON PLAN

		TENTATIVE EESSONTE			
Course T	itle: CAD	CAM	Course	Code: R16	641032
Section :	Sec B	Date: 11/6/202019		Page No	: 01 of 03
Revision 1	No: 00	Prepared By: R SAMBATH KUM	IAR	Approve	d By : HOD
Tools: Bla	ack board,	PPTs			
No. of		TOPIC		Date	Mode of
Periods					Delivery
UNIT-I	INTRO	DUCTION CAD CAM			
CO1: Ab	le to UNN	DERSTAND CAD CAM BASIC			
T TB: IF	BRAHIM Z	ZAHEED CAD CAM THEORY			
1	CAD CAN	M BASIC		18/6/2019	
2	Computers	s in industrial manufacturing, product cy	cle	19/6/2019	
3	CAD / CA	M Hardware	1	20/6/2019	
4	basic struc	cture, CPU		21/6/2019	
5	memory ty	ypes, input devices		22/6/2019	T a atuma
6	display de	vices, hard copy devices		23/6/2019	Lecture intersperse
7	Raster sca	n graphics coordinate system		24/6/2019	with
8	database s	tructure for graphics modeling		25/6/2019	discussions
9	transform	ation of geometry		26/6/2019	discussions
10	3D transfo	ormations, mathematics of projections		27/6/2019	
11	clipping			28/6/2019	
12	hidden su	rface removal		29/6/2019	
No. of		TOPIC		Date	Mode of
Periods					Delivery
UNIT-II	GEO]	METRIC MODELLING/DRAFTING	AND N	MODELLI	NG
CO1: Al	ole to UNN	DERSTAND GEOMETRIC MODLI	ING A	ND DRAFT	TING
T TB: P	RINCIPLI	ES CAD CAM BY PEARSON			
1	geometric	e modeling: Requirements		30/6/2019	
2	geometric	e models		1/7/2019	Lecture
3	geometric	c construction models		2/7/2019	intersperse
4	curve rep	resentation methods		3/7/2019	with
5	surface re	epresentation methods		4/7/2019	discussion

6	Modeling facilities desired.	5/7/2019	
7	Basic geometric commands	6/7/2019	
8	layers	7/7/2019	
9	display control commands	8/7/2019	
10	editing	9/7/2019	
11	dimensioning	10/7/2019	
12	Solid modelling	11/7/2019	
13	solid modeling	12/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-II	I PART PROGRAMMING		
CO1: Al	ole to UNNDERSTAND PROGRAMMING		
	BRAHIM ZAHEED CAD CAM THEORY		
1	NC, NC modes	13/7/2019	
2	NC elements	14/7/2019	
3	structure of CNC machine tools	15/7/2019	
4	features of Machining center	16/7/2019	
5	CNC Part Programming	17/7/2019	Lecture
6	manual part programming methods	19/7/2019	interspersed
7	Computer Aided Part Programming	19/7/2019	with
8	Direct Numerical Control	20/7/2019	discussions
9	Adaptive Control	21/7/2019	
10	CNC machine tools	22/7/2019	
11	turning center	23/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-IV	GROUP TECHNOLOGY		
CO1: Ab	ole to UNNDERSTAND group technology		
T TB: en	c and programming by thomson	•	
1	group technology: Part family	24/7/2019	
2	coding and classification	25/7/2019	Lecture
3	production flow analysis	26/7/2019	interspersed

4	types and advantages	27/7/2019	with
5	Computer aided processes planning	28/7/2019	discussions
6	Computer aided processes planning importance	29/7/2019	
7	Computer aided processes planning types	30/7/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-V	computer aided quality control		
CO1: Al	ole to UNNDERSTAND computer aided quality con	ntrol	
T TB: pr	roduct manufacturing by chang		
1	computer aided quality control	1/8/2019	
2	Terminology used in quality control	2/8/2019	
3	use of computers in Quality control	3/8/2019	Lecture
4	Inspection methods	4/8/2019	intersperse
5	contact and noncontact types	5/8/2019	with
6	computer aided testing	6/8/2019	discussions
7	integration of CAQC with CAD/CAM	7/8/2019	
No. of	TOPIC	Date	Mode of
Periods			Delivery
UNIT-V	COMPUTER INTEGRATED MANUFACT	URING SYSTE	M
CO1: A	ble to UNNDERSTAND CIM SYSTEM nc and programming by thomson		
CO1: A	ble to UNNDERSTAND CIM SYSTEM	8/8/2019	
CO1: A	ble to UNNDERSTAND CIM SYSTEM nc and programming by thomson	8/8/2019 9/8/2019	
CO1: A T TB: c	ble to UNNDERSTAND CIM SYSTEM nc and programming by thomson Types of manufacturing systems	8/8/2019	
CO1: A T TB: c	ble to UNNDERSTAND CIM SYSTEM nc and programming by thomson Types of manufacturing systems machine tools and related equipment	8/8/2019 9/8/2019	Lecture
CO1: A T TB: c 1 2 3	ble to UNNDERSTAND CIM SYSTEM nc and programming by thomson Types of manufacturing systems machine tools and related equipment material handling systems	8/8/2019 9/8/2019 10/8/2019	Lecture intersperse
CO1: A T TB: c 1 2 3	ble to UNNDERSTAND CIM SYSTEM ne and programming by thomson Types of manufacturing systems machine tools and related equipment material handling systems material requirement planning	8/8/2019 9/8/2019 10/8/2019 11/8/2019	Lecture intersperse with
CO1: A T TB: c 1 2 3 4 5	ble to UNNDERSTAND CIM SYSTEM ne and programming by thomson  Types of manufacturing systems machine tools and related equipment material handling systems material requirement planning computer control systems	8/8/2019 9/8/2019 10/8/2019 11/8/2019 12/8/2019	Lecture intersperse

Date: 11-6-2019

Signature of HOD

Date: 11.6.2019

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## TENTATIVE LESSON PLAN: R1641033 FINITE ELEMENT METHODS

Davision No . O		Page No	
Revision No : 0	- Julian Lumui	Approv	ved By : HOI
Tools: Black bo	ard, PPTs		
No. of Periods	TOPIC	Date	Mode of Delivery
UNIT-I INT	RODUCTION TO FEM		
CO1: To mak	e the student learn and understand the bas	ia nuinainlas af	C::4.
element analys	is procedure	ic principles of	linite
Prentice – Hall.	on to Finite Elements in Engineering / Chandr	aputla, Ashok an	d Belegundu
1	Introduction to finite element method	10/6/10	1
•	introduction to finite element method	10/6/19	
2	stress and equilibrium	11/6/19	_
		11,0,15	
3	strain – displacement relations	12/6/19	
4	stress – strain relations	1.4/6/10	
	suess – strain relations	14/6/19	
5	plane stress and plane strain conditions	17/6/19	
		1770/15	
6	variational and weighted residual	19/6/19	
7	methods		
1	concept of potential energy	20/6/19	Lecture
8	one dimensional problems.	21/6/10	interspersed with
	one amensional problems.	21/6/19	discussions
9	one dimensional problems.	24/6/19	discussions
10			
10	one dimensional problems.	26/6/19	
11	one dimensional problems.	20/6/10	
	one annensional problems.	28/6/19	
12	one dimensional problems.	01/7/19	
12	1' 1 11		
13	one dimensional problems.	02/7/19	

UNIT-II 1-D Problems

CO2: To learn the theory and characteristics of finite elements that represent engineering structures.

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall..C.S/World Scientific publications

14	Discretization of domain	3/7/19	
15	element shapes	4/7/19	
16	discretization procedures	5/7/19	
17	assembly of stiffness matrix	8/7/19	Lecture
18	band width, node numbering, mesh generation	9/7/19	interspersed with discussions
19	interpolation functions, local and global coordinates	10/7/19	discussions
20	interpolation functions, local and global coordinates	11/7/19	
21	convergence requirements	12/7/19	

UNIT-III Analysis of Trusses and beams:

CO3: To make the student learn about analysis of Trusses and beams:, and their applications.

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.

22	Finite element modeling	15/7/19	
23	coordinates and shape functions	16/7/19	
24	assembly of global stiffness matrix andload vector	17/7/19	Lecture interspersed
25	assembly of global stiffness matrix andload vector	19/7/19	with discussions
26	finite element equations	22/7/19	
27	simple problems on beams	24/7/19	
28	simple problems on beams	26/7/19	

UNIT-IV Finite element modeling of two dimensional stress analysis; CST CO4: To make students learn about Finite element modeling of two dimensionalstress analysis; CST and formulation of axisymmetric problems.

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.

Prentice - Hall.			
29	Finite element modeling of two dimensional	29/7/19	
	stress analysis with constantstrain triangles		
30	Finite element modeling of two dimensional	31/7/19	
	stress analysis with constantstrain triangles		
31	treatment of boundary conditions	2/8/19	
	11.1	5/0/10	Lecture
32	treatment of boundary conditions	5/8/19	interspersed
33	formulation of axisymmetric problems	6/8/19	with discussions
33			discussions
34	formulation of axisymmetric problems	8/8/19	
35	Problems on CST	12/8/19	
	D. III COT	14/8/19	
36	Problems on CST	14/6/19	
37	Problems on CST	16/8/19	
38	Problems on CST	19/8/19	
30	1 Toolems on Co.		
39	Problems on CST	20/8/19	
39	Problems on CST	20/8/19	

UNIT-V Higher order and isoparametric elements

CO5: To make students learn about Higher order and isoparametric elements

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu /

Prentice – Hall.

Higher order and isoparametric elements	22/8/19	
Higher order and isoparametric elements	26/8/19	
One dimensional quadratic and cubic	27/8/19	Lecture
One dimensional quadratic and cubic elements in natural coordinates	28/8/19	interspersed with
two dimensional four noded isoparametric	30/8/19	discussions
two dimensional four noded	2/9/19	
numerical integration	4/9/19	
	One dimensional quadratic and cubic elements in natural coordinates  One dimensional quadratic and cubic elements in natural coordinates  two dimensional four noded isoparametric elements  two dimensional four noded isoparametric elements	Higher order and isoparametric elements  One dimensional quadratic and cubic elements in natural coordinates  One dimensional quadratic and cubic elements in natural coordinates  two dimensional four noded isoparametric elements  two dimensional four noded isoparametric 2/9/19  isoparametric elements

Steady state heat transfer analysis and dynamic analysis CO6: To make students to learn about Steady state heat transfer analysis and dynamic analysis

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice - Hall

Prentice – Ha			
47	Steady state heat transfer analysis: one dimensional analysis of a fin	9/9/19	
48	two dimensional analysis of thin plate	11/9/19	
49	analysis of a uniform shaft subjected to torsion	16/9/19	
50	analysis of a uniform shaft subjected to torsion	19/9/19	
51	Problems on heat transfer problems	24/9/19	
52	Problems on heat transfer problems	26/9/19	
53	Problems on heat transfer problems	27/9/19	Lecture
54	Problems on heat transfer problems	28/9/19	interspersed
55	Dynamic Analysis: Formulation of finite	30/9/19	with
56	Element consistent and lumped mass	30/9/19	discussions
57	Eement consistent and lumped mass matrix	1/10/19	
58	Evaluation of eigen values and eigen vectors	1/10/19	
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### TENTATIVE LESSON PLAN: R1641033 FINITE ELEMENT METHODS

Section : Sec II		Page No	o: 01 of 04
Revision No : 00	J	Approv	ed By: HOI
Tools: Black boa No. of Periods	TOPIC	Date	Mode of
UNIT-I INT	RODUCTION TO FEM		Delivery
	e the student learn and understand the bas	sic principles of	finite
TB: Introductio Prentice – Hall.	n to Finite Elements in Engineering / Chandr	aputla, Ashok and	d Belegundu
1	Introduction to finite element method	10/6/19	
2	stress and equilibrium	11/6/19	
3	strain – displacement relations	12/6/19	
4	stress – strain relations	14/6/19	
5	plane stress and plane strain conditions	15/6/19	
6	variational and weighted residual methods	18/6/19	
7	concept of potential energy	20/6/19	Lecture intersperse
8	one dimensional problems.	22/6/19	with
9	one dimensional problems.	25/6/19	
10	one dimensional problems.	27/6/19	
11	one dimensional problems.	28/6/19	
12	one dimensional problems. 29/6/19	29/6/19	
13	one dimensional problems.	01/7/19	

UNIT-II 1-D Problems

CO2: To learn the theory and characteristics of finite elements that represent engineering structures.

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall...C.S/World Scientific publications

14	Discretization of domain	3/7/19	
15	element shapes	4/7/19	
16	discretization procedures	5/7/19	
17	assembly of stiffness matrix	6/7/19	Lecture
18	band width, node numbering, mesh generation	9/7/19	interspersed with
19	interpolation functions, local and global coordinates	10/7/19	discussions
20	interpolation functions, local and global coordinates	11/7/19	
21	convergence requirements	12/7/19	

UNIT-III Analysis of Trusses and beams:

CO3: To make the student learn about analysis of Trusses and beams:, and their applications.

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.

22	Finite element modeling	15/7/19	
23	coordinates and shape functions	16/7/19	
24	assembly of global stiffness matrix andload vector	17/7/19	Lecture interspersed
25	assembly of global stiffness matrix andload vector	19/7/19	with discussions
26	finite element equations	22/7/19	
27	simple problems on beams	24/7/19	
28	simple problems on beams	26/7/19	

UNIT-IV Finite element modeling of two dimensional stress analysis; CST CO4: To make students learn about Finite element modeling of two dimensionalstress analysis; CST and formulation of axisymmetric problems.

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall.

29	Finite element modeling of two dimensional	29/7/19	
	stress analysis with constantstrain triangles		
30	Finite element modeling of two dimensional	31/7/19	
	stress analysis with constantstrain triangles		
31	treatment of boundary conditions	2/8/19	
32	treatment of boundary conditions	5/8/19	- Lecture interspersed
33	formulation of axisymmetric problems	6/8/19	with discussions
34	formulation of axisymmetric problems	8/8/19	
35	Problems on CST	12/8/19	
36	Problems on CST	14/8/19	
37	Problems on CST	16/8/19	
38	Problems on CST	19/8/19	
39	Problems on CST	20/8/19	

UNIT-V Higher order and isoparametric elements

CO5: To make students learn about Higher order and isoparametric elements
TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu /
Prentice – Hall.

40	Higher order and isoparametric elements	22/8/19	
41	Higher order and isoparametric elements	26/8/19	
42	One dimensional quadratic and cubic elements in natural coordinates	27/8/19	
43	One dimensional quadratic and cubic elements in natural coordinates	28/8/19	
44	two dimensional four noded isoparametric elements	30/8/19	
45	two dimensional four noded isoparametric elements	2/9/19	Lecture interspersed
46	numerical integration	4/9/19	with discussions

UNIT-VI Steady state heat transfer analysis and dynamic analysis CO6: To make students to learn about Steady state heat transfer analysis and dynamic analysis

TB: Introduction to Finite Elements in Engineering / Chandraputla, Ashok and Belegundu / Prentice – Hall

47	Steady state heat transfer analysis: one dimensional analysis of a fin	9/9/19	
48	two dimensional analysis of thin plate	11/9/19	
49	analysis of a uniform shaft subjected to torsion	16/9/19	
50	analysis of a uniform shaft subjected to torsion	19/9/19	
51	Problems on heat transfer problems	24/9/19	
			Lecture
52	Problems on heat transfer problems	26/9/19	interspersed
53	Problems on heat transfer problems	27/9/19	with
54	Problems on heat transfer problems	28/9/19	discussions
55	Dynamic Analysis: Formulation of finite	30/9/19	
56	Element consistent and lumped mass	30/9/19	
57	Eement consistent and lumped mass matrix	1/10/19	
58	Evaluation of eigen values and eigen	1/10/19	
	vectors		

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## **TENTATIVE PLAN: R1641034**

G	TENTATIVE PLAN: R16410	34	
Course Title:	POWER PLANT ENGINEERING	Course code	e: R1641034
Section: Sec I	Date: 10-06-2019		(o: 01 to 03
Revision No: 0	- repared by. U. TAMU.		ved By: HOD
Tools: BLACE	K BOARD	112	vea by. HOD
No. of Periods	TOTIC	Date	Mode of
UNIT-I	STEAM POWER PLANT		Delivery
CO1: Able to to TB: "POWER	understand fundamentals of power plant layout & PLANT ENGINEERING", Er P.K.NAG.  UNIT-1: Steam Power Plant	its equipmer	nt's & their uses
1	Steam Power Plant Layout		
2	Working of different circuits	12/6/19	
3	Fuel and handling against	12/6/19	
4	Fuel and handling equipment's	13/6/19	
5	Types of coals, Coal handling	14/6/19	
6	Choice of handling equipment	14/6/19	
7	Coal storage, ash handling systems	15/6/19	
8	Combustion properties of coal	15/6/19	Lecture
9	Overfeed and underfeed fuel beds	16/6/19	interspersed
9	Travelling gate strokers, spreader strokers, retort	18/6/19	with
10	strokers		discussions
10	Pulverized fuel burning systems and its	19/6/19	
11	components		
	Combustion needs and draught systems	20/6/19	
12	Cyclone furnace, design and construction	21/6/19	
13	Dust collectors, cooling towers and heat rejection	22/6/19	
14 UNIT-II	Corrosion and feed water treatment	22/6/10	
CO2: Gain kno	INTERNAL COMBUSTION & GAS TURBINE will with combustion of engeneral Engineering, Er P.K.NAG.	POWER PLA ines & Gas to	ANTS urbine plants
	UNIT – 2:Internal combustion		
15	Internal combustion & Gas turbine power plants introduction	24/6/19	
16	Introduction about diesel engines	26/6/19	
17	Plant layout with auxiliaries	27/6/19	
18	Fuel supply systems	28/6/19	
19	Air starting equipment,	29/6/19	Lecture
20	Supercharging	03/7/19	interspersed
	Gas Turbine Power Plants	03/1/17	with
21	Gas turbine power plant, introduction	05/7/19	discussions
22	Classification,	06/7/19	
23	construction layout with auxiliaries	06/7/19	
24	Combined cycle power plants and comparison	10/7/19	
25	Problems on Gas turbine plants	10/7/10	
UNIT-III	HYDRO ELECTRIC POWED DI ANT & DROTT	Como	
TB:" POWER F	derstand fundamentals of Hydro Electric Power P PLANT ENGINEERING", Er Arora & Domkund		t its projects
	UNII - 3: Hydro Electric Power Plant		T
23	Hydro Electric Power Plant introduction		Lecture
26	Water power	18/7/19	interspersed
27	Hydrological cycle/flow measurement	19/7/19	with discussions
28	Drainage area characteristics	19/7/19	discussions
29	hydrographs, storage and pondage	20/7/19	
		20///17	

30	Classification of dams and spill ways	22/7/19	1
	Hydro Projects Plant	22/1/19	
31	Hydroelectric projects and plant-classification.		
	typical layouts	25/7/19	
32	Typical layouts	26/7/19	
33	Plant auxiliaries,	27/7/19	
34	Plant operation,	30/7/19	
35	Pumped storage plants	30/7/19	
36	Pumped storage plants	01/9/10	
UNIT-IV	NUCLEAR POWER STATION & TYPES OF R	FACTORG	
CO4: Able to	understand fundamentals of Nuclear power station	0 :4 1	rs principle
IB:" POWE	RTEANT ENGINEERING", Er Arora & Domkund	lwar.	principie
	UNIT - 4 NUCLEAR POWER STATION &		
27	REACTORS		
37	Nuclear power station introduction	02/8/19	
38	Nuclear fuel, breeding and fertile materials	03/8/19	Lecture
39	Nuclear reactor, reactor operation	16/8/19	intersperse
40	Types of reactors-pressurized water reactors	17/8/19	with
41	Boiling water reactor	20/8/19	discussion
42	Sodium graphite reactor	20/8/19	
43	fast breeder reactor	21/8/19	
44	homogeneous reactor	22/9/10	
UNIT-V CON	MBINED OPERATIONS OF DIFFERENT POWER TRUMENTATION & CONTROL	PLANTS &	DOWED
TO AL WILL CHI CHE	nowledge & become familiar with combined operation control  R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF		
TO AL WILL CHI CHE	UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER	-	
B: "POWEI	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL		
TO AL WILL CHI CHE	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-	23/8/19	
B: "POWEI	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants- introduction	23/8/19	
'B: "POWE)	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants- introduction  Advantages of combined working.	23/8/19	
45 46	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations	23/8/19 24/8/19 25/8/19	
45 46 47	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant	23/8/19 24/8/19 25/8/19 25/8/19	
45 46 47 48 49	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19	Lecture
45 46 47 48	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine	23/8/19 24/8/19 25/8/19 25/8/19	Lecture interspersed
45 46 47 48 49 50	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19	Lecture interspersed with
45 46 47 48 49	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19	Lecture interspersed with
45 46 47 48 49 50	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19	Lecture interspersed with
45 46 47 48 49 50	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19 06/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53 54	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53 54 55	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19 09/8/19 10/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53 54 55 56	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant  Measurement of gas purity	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19 10/8/19 11/8/19	Lecture interspersed with
45  46  47  48  49  50  51  52  53  54  55  56  57	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant  Measurement of gas purity  Gas analysis, oxygen and carbon dioxide	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19 09/8/19 11/8/19 11/8/19	Lecture interspersed with
45  46  47  48  49  50  51  52  53  54  55  56  57  58	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant  Measurement of gas purity  Gas analysis, oxygen and carbon dioxide  Measurements, nuclear measurements	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19 10/8/19 11/8/19 11/8/19	Lecture interspersed with discussions
45 46 47 48 49 50 51 52 53 54 55 56 57 58 NIT-VI PO	R PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant  Measurement of gas purity  Gas analysis, oxygen and carbon dioxide  Measurements, nuclear measurements  WER PLANT ECONOMICS & ENVIRONMENTA	23/8/19 24/8/19 25/8/19 25/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19 10/8/19 11/8/19 11/8/19 12/8/19	Lecture interspersed with discussions
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60	Capital cost	17/9/19
61	General arrangement of power distribution	18/9/19
62	Load curves	19/9/19
63	Load duration curve	20/9/19
64	Definition of connected load	24/9/19
65	Maximum demand	25/9/19
66	Demand factor,	26/9/19
67	Average load, Load factor	26/9/19
68	Diversity factor	27/9/19
69	Effluents from power plants	
70	Related exercises	28/9/19
71	Impact on environment	28/9/19
72	Load duration curve	28/9/19
73	Definition of connected load	29/9/19
74	Instrumentation in power plant	29/9/19
75	Measurement of gas purity	01/10/19
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Signature of Faculty

PRINCIPAL

SRK Institute of Technology ENIKEPADU, VIJAYAWADA-521 108

**TENTATIVE PLAN: R1641034** 

Section: Sec II	POWER PLANT ENGINEERING Date: 10-06-2019	Course code	o: 01 to 03
Revision No: 00	Prepared By: U. TANOI		ed By: HOD
Tools: BLACK	BOARD	Approv	eu by: HOD
No. of Periods	ТОРІС	Date	Mode of Delivery
UNIT-I	STEAM POWER PLANT		
CO1: Able to u TB: "POWER	nderstand fundamentals of power plant layout & PLANT ENGINEERING", Er P.K.NAG.  UNIT-1: Steam Power Plant	its equipmen	t's & their us
1	Steam Power Plant Layout		
2	Working of different circuits	12/6/19	
3	Fuel and handling equipment's	12/6/19	
4	Types of coals, Coal handling	13/6/19	
5	Choice of handling	14/6/19	
6	Choice of handling equipment	14/6/19	
7	Coal storage, ash handling systems	15/6/19	Tool
8	Combustion properties of coal	15/6/19	Lecture
9	Overfeed and underfeed fuel beds	16/6/19	intersperse
	Travelling gate strokers, spreader strokers, retort strokers	17/6/19	with discussion
10	Pulverized fuel burning systems and its components	18/6/19	-
11	Combustion needs and draught systems	20/6/19	
12	Cyclone frames 1 '		
2000/00-00	Cyclone lurnace, design and construction	21/6/10	
13	Cyclone furnace, design and construction  Dust collectors, cooling towers and heat rejection	21/6/19	
13 14 NIT-II O2: Gain know B: "POWER P	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE I Vledge & become familiar with combustion of engine LANT ENGINEERING", Er P.K.NAG.	22/6/19 22/6/19	NTS arbine plants
13 14 NIT-II O2: Gain know B: "POWER P	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE Is reledge & become familiar with combustion of enging LANT ENGINEERING", Er P.K.NAG. UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants	22/6/19 22/6/19 POWER PLA ines & Gas tu	NTS rbine plants
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13 14 NIT-II O2: Gain know B: "POWER P 15 16 17 18 19 20	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE I VIELDE & become familiar with combustion of enging LANT ENGINEERING", Er P.K.NAG. UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging	22/6/19 22/6/19 POWER PLA ines & Gas tu 24/6/19 25/6/19 26/6/19 28/6/19 29/6/19	Lecture
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13 14 NIT-II O2: Gain know B: "POWER P  15 16 17 18 19 20 21 22 23 24 25 IIT-III B: Able to und B: "POWER P	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE Is reledge & become familiar with combustion of enging LANT ENGINEERING", Er P.K.NAG.  UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging Gas Turbine Power Plants Gas turbine power plant, introduction Classification, construction layout with auxiliaries Combined cycle power plants and comparison Problems on Gas turbine plants HYDRO ELECTRIC POWER PLANT & PROJE Iterstand fundamentals of Hydro Electric Power P LANT ENGINEERING", Er Arora & Domkunds	22/6/19 22/6/19 POWER PLA ines & Gas tu 24/6/19 25/6/19 26/6/19 28/6/19 29/6/19 05/7/19 06/7/19 10/7/19 10/7/19	Lecture interspersed with discussions
13 14 NIT-II O2: Gain know B: "POWER P  15 16 17 18 19 20 21 22 23 24 25 IIT-III B: POWER P  IIII D3: Able to und B:" POWER P	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE Is velded & become familiar with combustion of eng. LANT ENGINEERING", Er P.K.NAG.  UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging Gas Turbine Power Plants Gas turbine power plant, introduction Classification, construction layout with auxiliaries Combined cycle power plants and comparison Problems on Gas turbine plants HYDRO ELECTRIC POWER PLANT & PROJE Ierstand fundamentals of Hydro Electric Power P LANT ENGINEERING", Er Arora & Domkundy UNIT – 3: Hydro Electric Power Plant	22/6/19 22/6/19 POWER PLA ines & Gas tu 24/6/19 25/6/19 26/6/19 28/6/19 29/6/19 05/7/19 06/7/19 10/7/19 10/7/19	Lecture interspersed with discussions
13 14 NIT-II O2: Gain know B: "POWER P  15 16 17 18 19 20 21 22 23 24 25 IIT-III D3: Able to und B:" POWER P  25 IF	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE Is reledge & become familiar with combustion of eng. LANT ENGINEERING", Er P.K.NAG. UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging Gas Turbine Power Plants Gas turbine power plant, introduction Classification, construction layout with auxiliaries Combined cycle power plants and comparison Problems on Gas turbine plants HYDRO ELECTRIC POWER PLANT & PROJE Iterstand fundamentals of Hydro Electric Power P LANT ENGINEERING", Er Arora & Domkundy UNIT – 3: Hydro Electric Power Plant Hydro Electric Power Plant Hydro Electric Power Plant	22/6/19 22/6/19 POWER PLA ines & Gas tu  24/6/19  25/6/19 26/6/19 28/6/19 29/6/19 03/7/19 06/7/19 06/7/19 10/7/19 10/7/19 CTS lant layout & var.	Lecture interspersed with discussions its projects
13 14 NIT-II O2: Gain know B: "POWER P  15 16 17 18 19 20 21 22 23 24 25 IIT-III B: POWER P  II O3: Able to und B: "POWER P  II O3: Able to und C3: "POWER P  II O4: POWER P  II O5: POWER P	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE Is viedge & become familiar with combustion of eng LANT ENGINEERING", Er P.K.NAG.  UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging Gas Turbine Power Plants Gas turbine power plant, introduction Classification, construction layout with auxiliaries Combined cycle power plants and comparison Problems on Gas turbine plants HYDRO ELECTRIC POWER PLANT & PROJE Ierstand fundamentals of Hydro Electric Power P LANT ENGINEERING", Er Arora & Domkundy UNIT – 3: Hydro Electric Power Plant	22/6/19 22/6/19 POWER PLA ines & Gas tu  24/6/19  25/6/19 26/6/19 28/6/19 29/6/19 03/7/19 06/7/19 06/7/19 10/7/19 10/7/19 CTS lant layout & var.	Lecture interspersed with discussions  its projects  Lecture interspersed
13 14 NIT-II O2: Gain know B: "POWER P  15 16 17 18 19 20 21 22 23 24 25 IIT-III B: POWER P  II 25 II 26 II 27 II E 26 II E 27 II E E E E E E E E E E E E E E E E E E	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE Is viedge & become familiar with combustion of eng LANT ENGINEERING", Er P.K.NAG.  UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging Gas Turbine Power Plants Gas turbine power plant, introduction Classification, construction layout with auxiliaries Combined cycle power plants and comparison Problems on Gas turbine plants HYDRO ELECTRIC POWER PLANT & PROJE Ierstand fundamentals of Hydro Electric Power P LANT ENGINEERING", Er Arora & Domkundy UNIT – 3: Hydro Electric Power Plant	22/6/19 22/6/19 POWER PLA ines & Gas tu  24/6/19  25/6/19 26/6/19 28/6/19 29/6/19 03/7/19 06/7/19 06/7/19 10/7/19 10/7/19 CTS lant layout & var.  17/7/19 18/7/19	Lecture interspersed with discussions  Lecture interspersed with discussions
13 14 NIT-II O2: Gain know B: "POWER P  15 16 17 18 19 20 21 22 23 24 25 IIT-III H3: Able to und B:" POWER PI  25 IF 26 VI 27 IF 28 III	Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE In Internal Combustion of engines LANT ENGINEERING", Er P.K.NAG. UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging Gas Turbine Power Plants Gas turbine power plant, introduction Classification, construction layout with auxiliaries Combined cycle power plants and comparison Problems on Gas turbine plants HYDRO ELECTRIC POWER PLANT & PROJE Iterstand fundamentals of Hydro Electric Power PLANT ENGINEERING", Er Arora & Domkundy UNIT – 3: Hydro Electric Power Plant Hydro Electric Power Plant introduction Vater power Hydrological cycle/flow measurement Orainage area characteristics.	22/6/19 22/6/19 POWER PLA ines & Gas tu  24/6/19  25/6/19 26/6/19 28/6/19 29/6/19 03/7/19 06/7/19 06/7/19 10/7/19 10/7/19 10/7/19 10/7/19 11/7/19 11/7/19 11/7/19 11/7/19 11/7/19 11/7/19 11/7/19	Lecture interspersed with discussions  its projects  Lecture interspersed
13 14 NIT-II O2: Gain know B: "POWER P  15 16 17 18 19 20 21 22 23 24 25 INIT-III H3: Able to und B:" POWER PI  25 IF 26 IF 27 IF 28 IF	Dust collectors, cooling towers and heat rejection Corrosion and feed water treatment INTERNAL COMBUSTION & GAS TURBINE Is viedge & become familiar with combustion of eng LANT ENGINEERING", Er P.K.NAG.  UNIT – 2:Internal combustion Internal combustion & Gas turbine power plants introduction Introduction about diesel engines Plant layout with auxiliaries Fuel supply systems Air starting equipment, Supercharging Gas Turbine Power Plants Gas turbine power plant, introduction Classification, construction layout with auxiliaries Combined cycle power plants and comparison Problems on Gas turbine plants HYDRO ELECTRIC POWER PLANT & PROJE Ierstand fundamentals of Hydro Electric Power P LANT ENGINEERING", Er Arora & Domkundy UNIT – 3: Hydro Electric Power Plant	22/6/19 22/6/19 POWER PLA ines & Gas tu  24/6/19  25/6/19 26/6/19 28/6/19 29/6/19 03/7/19 06/7/19 06/7/19 10/7/19 10/7/19 CTS lant layout & var.  17/7/19 18/7/19	Lecture interspersed with discussions  Lecture interspersed with discussions

31 32 33 34 35 36 UNIT-IV CO4: Able to TB:" POWER	Hydroelectric projects and plant-classification, typical layouts  Typical layouts  Plant auxiliaries,  Plant operation,  Pumped storage plants  Pumped storage plants  NUCLEAR POWER STATION & TYPES OF Runderstand fundamentals of Nuclear power station R PLANT ENGINEERING", Er Arora & Domkund	0	
32 33 34 35 36 UNIT-IV CO4: Able to	Typical layouts  Typical layouts  Plant auxiliaries,  Plant operation,  Pumped storage plants  Pumped storage plants  NUCLEAR POWER STATION & TYPES OF R understand fundamentals of Nuclear power station R PLANT ENGINEERING", Er Arora & Domkund	26/7/19 27/7/19 30/7/19 30/7/19 01/8/19 EACTORS	
33 34 35 36 UNIT-IV CO4: Able to	Plant auxiliaries, Plant operation, Pumped storage plants Pumped storage plants NUCLEAR POWER STATION & TYPES OF R understand fundamentals of Nuclear power station R PLANT ENGINEERING", Er Arora & Domkund	27/7/19 30/7/19 30/7/19 01/8/19 EACTORS	
34 35 36 UNIT-IV CO4: Able to	Plant operation, Pumped storage plants Pumped storage plants NUCLEAR POWER STATION & TYPES OF R understand fundamentals of Nuclear power station R PLANT ENGINEERING", Er Arora & Domkund	27/7/19 30/7/19 30/7/19 01/8/19 EACTORS	
35 36 UNIT-IV CO4: Able to	Pumped storage plants Pumped storage plants NUCLEAR POWER STATION & TYPES OF R understand fundamentals of Nuclear power station R PLANT ENGINEERING", Er Arora & Domkund	30/7/19 30/7/19 01/8/19 EACTORS	
36 JNIT-IV CO4: Able to	Pumped storage plants  NUCLEAR POWER STATION & TYPES OF R understand fundamentals of Nuclear power station R PLANT ENGINEERING", Er Arora & Domkund	30/7/19 01/8/19 <b>EACTORS</b>	
JNIT-IV CO4: Able to	NUCLEAR POWER STATION & TYPES OF R understand fundamentals of Nuclear power station R PLANT ENGINEERING", Er Arora & Domkund	01/8/19 EACTORS	
CO4: Able to	R PLANT ENGINEERING", Er Arora & Domkund	EACTORS	
	UNIT – 4 NUCLEAR POWER STATION & REACTORS	war.	rs principle
37			
38	Nuclear power station introduction	02/8/19	
39	Nuclear fuel, breeding and fertile materials	03/8/19	Lecture
40	Nuclear reactor, reactor operation	16/8/19	intersperse
41	Types of reactors-pressurized water reactors	17/8/19	with
42	Boiling water reactor	20/8/19	discussion
AND	Sodium graphite reactor	20/8/19	
43	fast breeder reactor	21/8/19	
44	homogeneous reactor IBINED OPERATIONS OF DIFFERENT POWER	22/2/1	
	PLANT ENGINEERING", Er P.C. SHARMA		er plants &
	nowledge & become familiar with combined operation control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF		er plants &
	on control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT – 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER		er plants &
	on control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL	tions of pow	er plants &
<b>B: "POWER</b> 45	nowledge & become familiar with combined operation control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction		er plants &
45 46	nowledge & become familiar with combined operation control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working.	23/8/19	er plants &
45 46 47	nowledge & become familiar with combined operation control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations	23/8/19 24/8/19	er plants &
45 46 47 48	nowledge & become familiar with combined operation control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant	23/8/19 24/8/19 25/8/19	er plants &
45 46 47 48 49	nowledge & become familiar with combined operation control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant	23/8/19 24/8/19 25/8/19 23/8/19	
45 46 47 48	nowledge & become familiar with combined operation control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19	Lecture
45 46 47 48 49 50	nowledge & become familiar with combined operaton control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations	23/8/19 24/8/19 25/8/19 23/8/19	Lecture
45 46 47 48 49 50	nowledge & become familiar with combined operaton control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19	Lecture interspersed
45 46 47 48 49 50 51	nowledge & become familiar with combined operaton control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydroelectric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19 06/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53	nowledge & become familiar with combined operaton control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19 06/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53 54	nowledge & become familiar with combined operator control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydroelectric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19 05/8/19 06/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53 54 55	nowledge & become familiar with combined operator control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53 54 55 56	nowledge & become familiar with combined operaton control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant  Measurement of gas purity	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19 05/8/19 06/8/19 07/8/19 09/8/19 10/8/19	Lecture interspersed with
45 46 47 48 49 50 51 52 53 54 55	nowledge & become familiar with combined operator control  PLANT ENGINEERING", Er P.C. SHARMA.  UNIT - 5 COMBINED OPERATIONS OF DIFFERENT POWER PLANTS & POWER PLANT INSTRUMENTATION & CONTROL  Combined operations of different power plants-introduction  Advantages of combined working,  Load distortion between power stations  Storage type hydroelectric power plant  Pumped storage plant  Coordination of hydro electric and gas turbine stations  Coordination of hydroelectric and nuclear power station stations  Coordination of different types of power plants  Power plant instrumentation and control  Importance of power plant  Instrumentation in power plant	23/8/19 24/8/19 25/8/19 23/8/19 04/8/19 05/8/19 06/8/19 07/8/19 08/8/19	Lecture interspersed with

61	General arrangement of power distribution	18/9/19	1
62	Load curves		-
63	Load duration curve	19/9/19	
64	Definition of connected load	20/9/19	-
65	Maximum demand	24/9/19	-
66	Demand factor,	25/9/19	Lecture
67		26/9/19	interspersed
68	Average load, Load factor	26/9/19	with
69	Diversity factor	27/9/19	discussions
	Effluents from power plants	28/9/19	
70	Related exercises	28/9/19	
71	Impact on environment	28/9/19	
72	Load duration curve	29/9/19	
73	Definition of connected load	29/9/19	
74	Instrumentation in power plant		
75	Measurement of gas purity	02/10/19	
	- Bas parity	02/10/19	

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Signature of HOD

# TENTATIVE LESSON PLAN: R164103C ADDITIVE MANUFACTUIRING

Course Title: Addit	ive Manufacturing	
Section : Sec A	Date: 10/06/19	Page No: 01 of 04
Revision No: 00	Prepared By :P. Bhagya Lakshmi	Approved By : HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of
,			Delivery

#### UNIT-I INTRODUCTION, LIQUID-BASED RAPID PROTOTYPING SYSTEMS

CO1: Able to understand prototyping fundamentals, advantages and limitations of rapid prototyping, classifications of RP. And also able to identify the use of SLA, SGC for manufacturing of complex components.

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

1	INTRODUCTION: Prototyping fundamentals	10/6/19	
2	historical development	11/6/19	
3	fundamentals of rapid prototyping	12/6/19	
4	advantages and limitations of rapid prototyping	14/6/19	
5	commonly used terms, classification of RP process	15/6/19	
6	LIQUID-BASED RAPID PROTOTYPING SYSTEMS: Stereo lithography Apparatus (SLA): models and specifications	17/6/19	
7	process, working principle	18/6/19	Lecture
8	photopolymers, photo polymerization	19/6/19	interspersed with
9	layering technology, laser and laser scanning	21/6/19	discussions
10	applications, advantages and disadvantages	22/6/19	
11	case studies	24/6/19	1
12	Solid Ground Curing (SGC): models and specifications	25/6/19	
13	process, working principle	26/6/19	
14	applications, advantages and disadvantages	28/6/19	

15	case studies.	29/6/19	

#### UNIT-II SOLID-BASED RAPID PROTOTYPING SYSTEMS

CO2: Able to identify the use of LOM, FDM for manufacturing of complex components

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

16	Laminated object manufacturing (LOM) - models and specifications	1/7/19	
17	, process, working principle	2/7/19	
18	applications, advantages and disadvantages	3/7/19	
19	case studies	5/7/19	Lecture
20	Fused deposition modelling (FDM) - models and specifications	6/7/19	interspersed with discussions
21	process, working principle	8/7/19	uiscussions
22	applications, advantages and disadvantages	9/7/19	
23	case studies	10/7/19	

#### NIT-III POWDER BASED RAPID PROTOTYPING SYSTEMS

CO3: Able to identify the use of SLS, 3DP for manufacturing of complex components

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

24	Selective laser sintering (SLS): models and specifications	13/7/19	
25	process, working principle	15/7/19	
26	applications, advantages and disadvantages	16/7/19	Lecture interspersed
27	case studies	17/7/19	with
28	three dimensional printing (3DP): models and specifications	20/7/19	discussions
29	process, working principle	22/7/19	
30	applications, advantages and disadvantages	23/7/19	

31 case studies 24/7/19

#### UNIT-IV RAPID TOOLING

CO4: Able to understand various indirect & direct tooling techniques

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

#### R1- Wohlers Report 2000 / Terry T Wohlers/Wohlers Associates

32	RAPID TOOLING: Introduction to rapid	26/7/19	
32	tooling (RT), conventional tooling Vs RT	20/1/19	
33	Need for RT, rapid tooling classification	27/7/19	
34	indirect rapid tooling methods: RTV epoxy tools ,spray metal deposition	29/7/19	
35	Ceramic tools, investment casting	39/7/19	Lecture interspersed
36	spin casting, die casting	31/7/19	with
37	sand casting	2/8/19	discussions
38	3D Keltool process	3/8/19	
39	Direct rapid tooling: direct AIM	14/8/19	
40	LOM Tools, DTM Rapid Tool Process	16/8/19	
41	EOS Direct Tool Process	17/8/19	
42	Direct Metal Tooling using 3DP	19/8/19	

## UNIT-V RAPID PROTOTYPING DATA FORMATS, RAPID PROTOTYPING SOFTWARE'S

CO5: Able to understand RP data formats, features of RP softwares and also able to identify the STL file problems and their repair.

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

#### R1- Wohlers Report 2000 / Terry T Wohlers/Wohlers Associates

43	RAPID PROTOTYPING DATA FORMATS: STL Format	29/8/19	
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44	STL File Problems	24/8/19	
45	consequence of building valid and invalid tessellated models	26/8/19	
46	STL file Repairs: Generic Solution	27/8/19	
47	other Translators	28/8/19	
48	Newly Proposed Formats	31/8/19	Lecture interspersed
49	RAPID PROTOTYPING SOFTWARE'S: Features of various RP software's : Magics	3/9/19	with
50	Mimics, Solid View	4/9/19	_ discussions
51	View Expert, 3 D View	6/9/19	
52	Velocity 2, Rhino	9/9/19	
53	STL View 3 Data Expert and 3 D doctor	11/9/19	

#### UNIT-VI RP APPLICATIONS

CO6: Able to understand apllications of RP in various industries & fields.

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

## R1- Wohlers Report 2000 / Terry T Wohlers/Wohlers Associates

RP APPLICATIONS: Application in	16/9/19	
engineering, analysis and planning		
aerospace industry	17/9/19	
automotive industry	20/9/19	
jewelry industry	21/9/19	
coin industry	23/9/19	
GIS application, arts and architecture	24/9/19	Lecture
RP medical and bioengineering applications: planning and simulation of complex surgery	25/9/19	interspersed with
customized implants & prosthesis	27/9/19	discussions
design and production of medical devices	28/9/19	
	engineering, analysis and planning aerospace industry  automotive industry  jewelry industry  coin industry  GIS application, arts and architecture  RP medical and bioengineering applications: planning and simulation of complex surgery customized implants & prosthesis	engineering, analysis and planning aerospace industry  17/9/19  automotive industry  20/9/19  jewelry industry  21/9/19  coin industry  23/9/19  GIS application, arts and architecture  24/9/19  RP medical and bioengineering applications: planning and simulation of complex surgery customized implants & prosthesis  27/9/19

63	forensic science and anthropology	30/9/19
64	visualization of bimolecular	1/10/19
Signature o	of Faculty	Signature of HOD
	PRINCIPAL	

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## TENTATIVE LESSON PLAN: R164103C ADDITIVE MANUFACTUIRING

Course Title: Addit	ive Manufacturing	Page No: 01 of 04
Section : Sec B	Date: 10/06/19	Approved By : HOD
Revision No: 00	Prepared By :P. Bhagya Lakshmi	Approved by . HOD

Tools: Black board, PPTs

No. of Periods	TOPIC	Date	Mode of Delivery
		THE STATE OF THE	CONTRACT

## UNIT-I INTRODUCTION, LIQUID-BASED RAPID PROTOTYPING SYSTEMS CO1: Able to understand prototyping fundamentals, advantages and limitations of rapid

prototyping, classifications of RP. And also able to identify the use of SLA, SGC for manufacturing of complex components.

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

		10/6/19	
1	INTRODUCTION: Prototyping fundamentals		
2	historical development	11/6/19	
3	fundamentals of rapid prototyping	12/6/19	
4	advantages and limitations of rapid prototyping	13/6/19	
5	commonly used terms, classification of RP	14/6/19	
6	process LIQUID-BASED RAPID PROTOTYPING	17/6/19	
0	SYSTEMS: Stereo lithography Apparatus (SLA): models and specifications		
7	process, working principle	19/6/19	Lecture interspersed
8	photopolymers, photo polymerization	20/6/19	with
9	layering technology, laser and laser scanning	21/6/19	discussions
10	applications, advantages and disadvantages	24/6/19	
11	case studies	25/6/19	
12	Solid Ground Curing (SGC): models and	26/6/19	
	specifications	28/6/19	
13	process, working principle	1/7/19	
14	applications, advantages and disadvantages	1///19	

15	case studies.	2/7/19	

#### UNIT-II SOLID-BASED RAPID PROTOTYPING SYSTEMS

CO2: Able to identify the use of LOM, FDM for manufacturing of complex components

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

16	Laminated object manufacturing (LOM) - models and specifications	3/7/19	
17	process, working principle	4/7/19	
18	applications, advantages and disadvantages	5/7/19	
19	case studies	8/7/19	Lecture
20	Fused deposition modelling (FDM) - models and specifications	9/7/19	interspersed
21	process, working principle	10/7/19	discussions
22	applications, advantages and disadvantages	11/7/19	
23	case studies	12/7/19	

#### NIT-III POWDER BASED RAPID PROTOTYPING SYSTEMS

CO3: Able to identify the use of SLS, 3DP for manufacturing of complex components

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

24	Selective laser sintering (SLS): models and specifications	15/7/19	
25	process, working principle	16/7/19	
26	applications, advantages and disadvantages	18/7/19	Lecture
27	case studies	19/7/19	interspersed with
28	three dimensional printing (3DP): models and specifications	22/7/19	discussions
29	process, working principle	23/7/19	
30	applications, advantages and disadvantages	24/7/19	

31 case studies 25/7/19

#### UNIT-IV RAPID TOOLING

CO4: Able to understand various indirect & direct tooling techniques

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

#### R1- Wohlers Report 2000 / Terry T Wohlers/Wohlers Associates

32	RAPID TOOLING: Introduction to rapid	29/7/19	
	tooling (RT), conventional tooling Vs RT		
33	Need for RT, rapid tooling classification	30/7/19	
34	indirect rapid tooling methods: RTV epoxy tools ,spray metal deposition	31/7/19	Lecture
35	Ceramic tools, investment casting	1/8/19	interspersed with
36	spin casting, die casting	2/8/19	discussions
37	sand casting	14/8/19	
38	3D Keltool process	16/8/19	
39	Direct rapid tooling: direct AIM	19/8/19	
40	LOM Tools, DTM Rapid Tool Process	20/8/19	
41	EOS Direct Tool Process	21/8/19	
42	Direct Metal Tooling using 3DP	22/8/19	
TINITE X	DANK PROTOTYPING DATA FORMATC	DADID DDA	OFFORWARIA

## UNIT-V RAPID PROTOTYPING DATA FORMATS, RAPID PROTOTYPING SOFTWARE'S

CO5: Able to understand RP data formats, features of RP softwares and also able to identify the STL file problems and their repair.

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

#### R1- Wohlers Report 2000 / Terry T Wohlers/Wohlers Associates

43	RAPID PROTOTYPING DATA FORMATS: STL Format	26/8/19
44	STL File Problems	27/8/19
44	STETHETTODIEMS	27/0/19

45	consequence of building valid and invalid tessellated models	28/8/19	
46	STL file Repairs: Generic Solution	29/8/19	
47	other Translators	30/8/19	Lecture
48	Newly Proposed Formats	3/9/19	interspersed
49	RAPID PROTOTYPING SOFTWARE'S: Features of various RP software's : Magics	4/9/19	discussions
50	Mimics, Solid View	5/9/19	
51	View Expert, 3 D View	6/9/19	
52	Velocity 2, Rhino	9/9/19	
53	STL View 3 Data Expert and 3 D doctor	11/9/19	

#### UNIT-VI RP APPLICATIONS

CO6: Able to understand apllications of RP in various industries & fields.

TB: Rapid prototyping: Principles and Applications /Chua C.K., Leong K.F. and LIM C.S/World Scientific publications

#### R1- Wohlers Report 2000 / Terry T Wohlers/Wohlers Associates

RP APPLICATIONS: Application in	12/9/19	
engineering, analysis and planning		
aerospace industry	13/9/19	
automotive industry	16/9/19	
jewelry industry	17/9/19	
coin industry	18/9/19	
GIS application, arts and architecture	19/9/19	
RP medical and bioengineering applications: planning and simulation of complex surgery	20/9/19	Lecture
customized implants & prosthesis	23/9/19	with discussions
design and production of medical devices	24/9/19	
forensic science and anthropology	25/9/19	
	aerospace industry  automotive industry  jewelry industry  coin industry  GIS application, arts and architecture  RP medical and bioengineering applications: planning and simulation of complex surgery customized implants & prosthesis  design and production of medical devices	aerospace industry  automotive industry  jewelry industry  coin industry  18/9/19  GIS application, arts and architecture  RP medical and bioengineering applications: planning and simulation of complex surgery  customized implants & prosthesis  23/9/19  design and production of medical devices  24/9/19

64	visualization of bimolecular	1/10/19
Signature o	f Faculty	Signature of HOD

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## TENTATIVE PLAN: R164103D

	R164103D		
	ADVANCED MATERIALS	Course code:	
Section : Sec I	Date: 18-11-2019	Page No	: 01 to 03
Revision No : 0	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Approve	ed By: HOD
Tools: BLACK	BUARD	7-1	1
No. of Periods	TOPIC	Date	Mode of Delivery
CO1: Become t	NTRODUCTION  Samiliar with a basic concept of composite mate  CED MATERIALS", M DANIEL ISSAC.	erials	
	UNIT – 1 INTRODUCTION TO COMPOSITE MATERIALS		
1	Introduction	18/11/2019	+
2	Introduction, definition, classification of polymers	19/11/2019	Lecture
3	classification of polymers,Polymer matrix composites	20/11/2019	interspersed
4	Metal matrix composites, Ceramic matrix composites	21/11/2019	discussions
5	Metal matrix composites, Ceramic matrix composites	21/11/2019	
6	Fiber-reinforced composites, nature made composites and application	23/11/2019	
7	Fiber-reinforced composites, nature made composites and application	25/11/2019	
8	Fiber-reinforced composites, nature made composites and application	27/11/2019	
CO2: Gain kno	LYMER COMPOSITES wledge about polymer composites		
TB:" ADVANC	CED MATERIALS", M DANIEL ISSAC.		
	UNIT – 2 POLYMER COMPOSITES		
9	Fiber reinforcements, fiber, glass, silica	30/11/2019	
10	Fiber reinforcements, fiber, glass, silica	02/12/2019	
11	Fiber reinforcements of silica, Kevlar, carbon	03/12/2019	
12	Fiber reinforcements of silica, Kevlar, carbon	04/12/2019	
13	Fiber reinforcements of carbon, boron, silicon carbide	05/12/2019	Lecture interspersed
14	Fiber reinforcement of silicon carbide, boron carbide	05/12/2019	with discussions
15	Fiber reinforcement of silicon carbide, boron carbide	05/12/2019	
16	Polymer composites, thermoplastic and thermosetting plastics	07/12/2019	
17	Polymer composites, thermoplastic and thermosetting plastics	09/12/2019	
18	Thermosetting plastic, and manufacturing of PMC	10/12/2019	
19	Manufacturing of MMC, CCC and their application	11/12/2019	

**UNIT-III MANUFACTURING METHODS** CO3: Become familiar with the concepts of MANUFACTURING METHODS TB:" ADVANCED MATERIALS", M DANIEL ISSAC. UNIT-3 MANUFACTURING METHODS 31 Autoclave manufacturing methods 18/12/2019 32 Molding methods, filament winding 19/12/2019 33 Molding methods, filament winding

Filament winding, hand layup, pultrusion and

Filament winding, hand layup, pultrusion and

Filament winding, hand layup, pultrusion and

**UNIT-IV** MACROMECHANICAL ANALYSIS OF A LAMINA

CO4: Gain knowledge about concept of Macromechanical analysis of lamina

TB:"ADVANCED MATERIALS", M DANIEL ISSAC.

34

35

36

**RTM** 

**RTM** 

	UNIT -4 MACROMECHANICAL ANALYSIS OF A LAMINA		
39	Introduction, generalized hooks law	30/12/2019	T.,
40	Introduction, generalized hooks law	31/12/2019	Lecture interspersed
41	Reduction of hooks law from 3D to 2D	02/01/2020	with
42	Reduction of hooks law from 3D to 2D	06/01/2020	discussions
43	Relation ship of compliance	06/01/2020	aiscussions
44	Stiffness matrix to engineering elastic constant	07/01/2020	
45	Stiffness matrix to engineering elastic constant	09/01/2020	
46	Orthotrofic lamina, laminate-laminate codes	10/01/2020	
47	Orthotrofic lamina, laminate-laminate codes	27/01/2020	

Lecture

interspersed

with

discussions

19/12/2019

23/12/2019

24/12/2019

26/12/2019

UNIT-V FUNCTIONALLY GRADED MATERIALS

CO5: Become familiar with functional graded materials

TB:"ADVANCED MATERIALS", M DANIEL ISSAC.

	UNIT — 5 FUNCTIONALLY GRADED MATERIALS		
48	Types of functionally graded materials	28/01/2020	
49	Types of functionally graded materials	29/01/2020	
50	System preparations p properties of graded materials and applications of functionally graded, materials	31/01/2020	Lecture intersperse with
51	properties of graded materials and applications of functionally graded, materials	03/02/2020	discussion
52	Introduction to shape memory alloy, shape memory effect	04/02/2020	
53	Introduction to shape memory alloy, shape memory effect	05/02/2020	
54	Classification of shape memory alloy composition	06/02/2020	
55	Application of shape memory alloys	07/02/2020	

# CO6: Become familiar with concepts of NANO MATERIALS TB: "ADVANCED MATERIALS", M DANIEL ISSAC.

	UNIT – 6 NANO MATERIALS		
56	Introduction and properties of nano materials	08/02/2020	T
57	Introduction and properties of nano materials	10/02/2020	Lecture interspersed with discussions
58	Nano scales advantages and dis advantages	11/02/2020	
59	Application in comparison with bulk materials	12/02/2020	
60	Application in comparison with bulk materials	13/02/2020	
61	State of art nano advanced and topic delivered by student	14/02/2020	
62	State of art nano advanced and topic delivered by student	15/02/2020	

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## **TENTATIVE PLAN: R164103D**

Course Title: A	DVANCED MATERIALS	Course code:	R164103D	
Section : Sec II	: Sec II Date : 18-11-2019 Page No		: 01 to 03	
Revision No : 00	Prepared By : Dr.S.S.BALAJI	Approve	ed By: HOD	
Tools: BLACK		1. 2. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	1912-1-11-11-1	
No. of Periods	TOPIC	Date	Mode of delivery	
UNIT-I	NTRODUCTION			
	amiliar with a basic concept of composite ED MATERIALS", M DANIEL ISSAC I			
	UNIT - 1 INTRODUCTION TO COMPOSITE MATERIALS			
1	Introduction	18/11/2019		
2	Introduction, definition, classification of polymers	19/11/2019		
3	classification of polymers,Polymer matrix composites	20/11/2019	Lecture interspersed	
4	Metal matrix composites, Ceramic matrix composites	21/11/2019	with discussions	
5	Metal matrix composites, Ceramic matrix composites	22/11/2019		
6	Fiber-reinforced composites, nature made composites and application	23/11/2019		
7	Fiber-reinforced composites, nature made composites and application	25/11/2019		
8	Fiber-reinforced composites, nature made composites and application	27/11/2019		
	LYMER COMPOSITES			
	wledge about polymer composites			
	ED MATERIALS", M DANIEL ISSAC.			
	UNIT – 2 POLYMER COMPOSITES			
17	Fiber reinforcements, fiber, glass, silica	30/11/2019		
18	Fiber reinforcements, fiber, glass, silica	02/12/2019		
19	Fiber reinforcements of silica, Kevlar, carb			
20	Fiber reinforcements of silica, Kevlar, carb	on 04/12/2019	<u> </u>	
21	Fiber reinforcements of carbon, boron, silicarbide	on 04/12/2019	Lecture interspersed with discussions	
22	Fiber reinforcement of silicon carbide, bor carbide	on 05/12/2019		
23	Fiber reinforcement of silicon carbide, bor carbide	on 06/12/2019		
24	Polymer composites, thermoplastic and thermosetting plastics	07/12/2019		
25	Polymer composites, thermoplastic and thermosetting plastics	09/12/2019		
nng 0.26	Thermosetting plastic, and manufacturing PMC	of 10/12/2019	1707-1708-201	
eir 27 1	Manufacturing of MMC, CCC and their application	11/12/2019		

#### UNIT-III MANUFACTURINGMETHODS

CO3: Become familiar with the concepts of MANUFACTURINGMETHODS

TB: "ADVANCED MATERIALS", M DANIEL ISSAC.

				_
	UNIT-3 MANUFACTURING METHODS			
31	Autoclave manufacturing methods	18/12/2019	Appendix and the second	-
32	Molding methods, filament winding	19/12/2019	Lecture	
33	Molding methods, filament winding	19/12/2019	interspersed	
34	Filament winding, hand layup, pultrusion and RTM	23/12/2019	with discussions	
35	Filament winding, hand layup, pultrusion and RTM	24/12/2019		
36	Filament winding, hand layup, pultrusion and RTM	26/12/2019		The same of

#### UNIT-IV MACROMECHANICAL ANALYSIS OF A LAMINA

CO4: Gain knowledge about concept of Macromechanical analysis of lamina

TB: "ADVANCED MATERIALS", M DANIEL ISSAC.

	UNIT -4 MACROMECHANICAL		
	ANALYSIS OF A LAMINA		
39	Introduction, generalized hooks law	30/12/2019	Lastrina
40	Introduction, generalized hooks law	31/12/2019	Lecture interspersed
41	Reduction of hooks law from 3D to 2D	02/01/2020	with
42	Reduction of hooks law from 3D to 2D	06/01/2020	discussions
43	Relation ship of compliance	06/01/2020	41544551415
44	Stiffness matrix to engineering elastic constant	07/01/2020	
45	Stiffness matrix to engineering elastic constant	09/01/2020	
46	Orthotrofic lamina, laminate-laminate codes	10/01/2020	
47	Orthotrofic lamina, laminate-laminate codes	27/01/2020	

#### UNIT-V FUNCTIONALLY GRADED MATERIALS

CO5: Become familiar with functional graded materials

TB: "ADVANCED MATERIALS", M DANIEL ISSAC.

	UNIT — 5 FUNCTIONALLY GRADED MATERIALS		
52	Types of functionally graded materials	28/01/2020	
53	Types of functionally graded materials	29/01/2020	
54	System preparations p properties of graded materials and applications of functionally graded, materials	31/01/2020	Lecture interspersed with discussions
55	properties of graded materials and applications of functionally graded, materials	03/02/2020	
56	Introduction to shape memory alloy, shape memory effect	04/02/2020	
57	Introduction to shape memory alloy, shape memory effect	05/02/2020	
58	Classification of shape memory alloy composition	06/02/2020	
59_	Application of shape memory alloys	07/02/2020	

application

#### UNIT-VI NANO MATERIALS

CO6: Become familiar with concepts of

NANO MATERIALS

TB: "ADVANCED MATERIALS", MDANIEL ISSAC.

	UNIT -6 NANO MATERIALS		
60	Introduction and properties of nano materials	08/02/2020	
61	Introduction and properties of nano materials	11/02/2020	Lecture
62	Nano scales advantages and dis advantages	11/02/2020	interspersed
63	Application in comparison with bulk materials	12/02/2020	with
64	Application in comparison with bulk materials	12/02/2020	discussions
65	State of art nano advanced and topic delivered by student	14/02/2020	
66	State of art nano advanced and topic delivered by student	16/02/2020	

J.S.S. Kaloii

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