## RGPV (DIPLOMA WING) BHOPAL

## OBE CURRICULUM FOR THE COURSE

FORMAT - 3

Sheet No.

Branch

CHEMICAL

Semester

5

**Course Code** 

Course Name

PROCESS HEAT TRANSFER

Course	Student will be able to understand modes of heat transfer and heat transfer by conduction	Teach	Marks
Outcome 1		Hrs	
Learning	Student will be able to explain theory of steady-state one	6	5
Outcome 1	dimensional heat flow in conduction		
Contents	Modes of heat transfer, fouriers law, steady state and unsteady		
	state, fouriers law for steady state one dimensional heat flow,		
	thermal conductivity, simple numerical problems		
Method of	Paper Pen Test		
Assessment			
Learning	Student will be able to solve problem of conduction heat	14	10
Outcome 2	transfer of given system.		
Contents	Steady-state conduction through flat slab, compound resistance		
	in series, coaxile cylinder and sphere. Log mean radius, critical		
	radius of insulation, simple numerical problems		
Method of	Theory Exam		
Assessment			
Learning	Student will be able to calculate heat transfer through	6	10
Outcome 3	composite wall, lagged pipe of given setup.		
Contents	Perform in laboratory		
Method of	Laboratory Test by observation		
Assessment			
Learning	Student will be able to calculate thermal conductivity of given	6	10
Outcome 4	powder and flat slab.		
Contents	Perform in laboratory		
Method of	Laboratory Test by observation		
Assessment			
Course	Student will be able to understand principle of heat flow in fluid		
Outcome 2	and fundamentals of connective heat transfer.		
Learning	Student will be able to explain theory of heat flow in fluid.	8	5
Outcome 1			
Contents	Approaches and temperature range for heat exchanging		
	equipments, flow pattern, temperature length curve, rate of heat		
	transfer, heat flux, and average temperature.		
Method of	Theory Exam		
Assessment			

<b>T</b> •	Student will be able to coloulate basis nonemator of best	11	17
Learning	Student will be able to calculate basic parameter of heat exchanging equipment design.	11	15
Outcome 2			
Contents	Over all heat transfer coefficient, logarithmic mean temperature difference, enthalpy balance in heat exchanger and total condenser, individual heat transfer coefficient, calculation of overall heat transfer coefficient from individual coefficient, fouling factor, controlling resistance, simple numerical problems.		
Method of	Theory Exam		
Assessment			
Learning Outcome 3	Student will be able to understand theory and design equation of heat exchanging equipments.	10	10
	Thermal boundary layer, laminar flow heat transfer by forced		
Contents	convection in tubes, by forced convection in tubuler flow, Dittus-Bolter equation, Sieder-Tate equation, natural convection, equation for heat transfer in natural convection, heat transfer from condensing vapor, drop wise and film type condensation.		
Method of	Paper Pen Test		
Assessment			
Learning Outcome 4	Student will be able to evaluate individual heat transfer coefficient in natural and forced convection in given setup.	12	15
Contents	Perform in laboratory		
Method of	Laboratory Test by observation		
Assessment			
Course Outcome 3	Student will be able to understand thermal radiation and radiation heat transfer.		
Learning Outcome 1	Student will be able to explain theory of radiation and solve basic problem.	10	15
Contents	Nature of thermal radiation, wave length and frequency, origin of radiant energy, distribution of radiant energy, emissive power, planck's law Wien's displacement law, absorption, reflection and transmission. Blackbody, laws of black body radiation, stefan-boltzmann law radiation from non black surface, kirchhoff's law, whitebody, gray body. Exchange of radiation energy between two large parallel planes for both black body and for different emissivity simple numerical problems.		
Method of	Paper Pen Test		
Assessment			
Learning	Student will be able to evaluate Stefan-Boltzmann law constant	6	10
Outcome 2	in given setup.		
Contents	Perform in laboratory		

Assessment			
Learning	Student will be able to evaluate emissivity of plate in given	6	5
Outcome 3	setup.	U	C
Contents	Perform in laboratory		
Method of	Laboratory Test by observation		
Assessment			
Course	Student will be able to understand and analyze heat exchanging		
Outcome 4	equipments.		
Learning	Student will be able to understand working and able to design	10	10
Outcome 1	double pipe heat exchange.		-
Contents	Types of heat exchanger based on function and flow arrangement, construction and working of double-pipe heat exchanger simple problems of calculation of length, area, rate of heat transfer, simple design problems.		
Method of	Theory Exam		
Assessment			
Learning	Student will be able to understand working and able to design 1	10	10
Outcome 2	- 1 and 1 - 2 shell and tube heat exchanger.		
Contents	Construction and working of 1-1 and 1-2 shell and tube heat exchange, heat exchanger tubes, tube pitch, tube layout, baffles, shell, correction of LMTD for cross flow, plate type heat exchanger, extended surface equipment, simple design problems.		
Method of	Theory Exam		
Assessment			
Course	Student will be able to understand and analyze evaporators.		
Outcome 5			
Learning	Student will be able to explain theory of evaporator.	10	10
Outcome 1			
Contents	Effect of liquid characteristics, single and multiple effect evaporator, boiling point elevation, Duhring's rule, enthalpy concentration diagram, construction and working of following evaporators (a) horizontal tube, (b) calandriya type, (c) long tube vertical, (d) forced circulation.		
Method of	Theory Exam		
Assessment			
Learning	Student will be able to calculate parameter required for	10	10
Outcome 2	evaporator design.		
Contents	Enthalpy balance (single effect), performance of tubular evaporator, capacity, economy, area, methods of feeding to multiple effect evaporator, design calculation for single effect (area, economy and capacity)		
Method of	Theory Exam		
Assessment			

RG	GPV (Diplom	a Wing ) Bhopal	SCHEME FOR L OUTCOM		F	Branch (	Code	Co	urse C	ode	CO Code	LO Code	For	mat No. <b>4</b>
					C	0	2				1	1	_	
COURS	E NAME	PROCESS HEAT TRAN	NSFER			I		I		1 1				
CO Des	scription	Student will be able	e to understand modes of hea	at transfer and	heat tran	sfer by co	onducti	on						
LO Des	scription	Student will be ab	ble to explain theory of stea	dy-state one o	limensior	nal heat	flow in	condu	ction					
			S	SCHEME OI	F STUDY	Z								
S. No.	Learni	ng Content	Teaching –Learning Method	Desc	ription o Process			Teach Hrs.		Pract. ut Hrs	. LRs	Require	ed	Remarks
1	law, steady state, fouri state one di	eat transfer, fourier state and unstead ers law for stead mensional heat flow onductivity, simple problems	y Method y	Faculty wil content. To identify assignment accordingly tutorials wi	students will be g	weaknes iven and l and	ss	6			bool hand	louts, erpoint,		
			SCH	IEME OF AS	SESSM	ENT								
S. No.	Method	of Assessment	Description of Assess	sment	Maxim Marl			Res	ources	s Requ	ired			External / Internal
1	Paper-Pen Te	est	Theory question (include simple numerical proble related to the learned con will be asked in the test	em) ntent	5			Test F	aper +	- Ratin	g Scale			Internal
		I	ADDITIONAL INSTRUC	TIONS FOR	THE H	OD/ FA	CULT	Y (IF	ANY)					
				Nil										
				Nil										

RG	GPV (Diplom	a Wing ) Bhopal	SCHEME FOR L OUTCOM		Br	anch Co	ode	Cou	rse Code	CO Code	LO Code	Format No. <b>4</b>
					С	0	2			1	2	
OURS	E NAME	PROCESS HEAT TRAI	NSFER		I				I			
CO Des	scription	Student will be abl	e to understand modes of hea	at transfer and	heat transfe	er by con	duction					
LO Des	scription	Student will be al	ble to solve problem of cond	luction heat t	ransfer of g	iven sys	tem.					
			S	SCHEME O	F STUDY							
S. No.	Learni	ng Content	Teaching –Learning Method	Des	cription of Process	T-L		'each Hrs.	Pract. /Tut Hr	s. LRs	Require	d Remark
	series, co sphere. Log	mpound resistance in axile cylinder and g mean radius, critica insulation, simple problems	1 1 e	content. To identify assignment accordingly tutorials wi	y remedial a ill be arrang	en and .nd ed.				text han	douts, verpoint,	S,
S. No.	Method	of Assessment	Description of Assess		Maximu Marks			Reso	urces Req	uired		External / Internal
1	Theory Exan	n	Theory questions related learned content will be a the university question p	sked in	10			Qı	lestion pap	er		External
			ADDITIONAL INSTRU	JCTIONS F	OR THE H	OD/ FA	CULI	Y (IF	ANY)		I	
				Nil								

RG	PV (Diplom	a Wing ) Bhopal	SCHEME FOR L OUTCOM		Br	anch Co	ode	Cou	rse Code	CO Code	LO Code	Format No. 4
					С	0	2			1	3	
COURS	E NAME	PROCESS HEAT TRAI	NSFER		I				I			
CO Des	scription	Student will be abl	e to understand modes of hea	it transfer and h	neat transfe	er by con	duction					
LO Des	cription	Student will be at	ble to calculate heat transfer	through comp	osite wall	lagged	pipe of	fgiven	setup.			
			S	SCHEME OF	STUDY							
S. No.	Learni	ing Content	Teaching –Learning Method	Desc	ription of Process	T-L		Feach Hrs.	Pract. /Tut Hrs	LRs	Requir	ed Remarks
1	Perform in	laboratory	Lab-demonstration	Faculty will perform in la how to take observation rate of heat t conductivity how these da an equipmer	ab and der readings. I are use to ransfer an faculty w ata are use	nonstrat How the calculat d therm ill expla	ese e al uin		6	Exp setu Mar Vide	ual	ab
			SCH	EME OF AS	SESSME	NT						·
S. No.	Method	of Assessment	Description of Assess	sment	Maximu Marks	n		Reso	ources Requ	iired		External / Internal
1	Laboratory 7	Test by observation	Examiner will ask to stu- take reading and then ca in front of him and will a correctness of result	lculate	10			H	Rating Scale			External
			ADDITIONAL INSTRU	CTIONS FOR	R THE HO	DD/ FA	CULT	Y (IF A	NY)			
				Nil								

RG	SPV (Diplom	a Wing ) Bhopal	SCHEME FOR L OUTCOM		Bra	nch Co	de	Cou	rse Code	CO Code	LO Code	Format No. 4
					С	0	2			1	4	
OURS	E NAME	PROCESS HEAT TRAN	ISFER		I		1		I			
CO Des	scription	Student will be able	e to understand modes of hea	at transfer and h	neat transfe	r by con	duction					
LO Des	scription	Student will be able	e to calculate thermal conduc	tivity of given p	owder and	flat slab.						
			S	SCHEME OF	STUDY							
S. No.	Learni	ing Content	Teaching –Learning Method	Desc	ription of Process	T-L		`each Hrs.	Pract. /Tut Hrs	LRs	Require	ed Remarks
1	Perform in		Lab-demonstration	Faculty will perform in la how to take observation rate of heat t conductivity how these da an equipmer	ab and den readings. H are use to transfer and faculty wi ata are use nt.	ionstrate Iow the calculate I therma II explai to desig	se l l in		6	Setu Mar Vide	nual	ıb
			SCH	IEME OF AS	SESSMEN	NT						
S. No.	Method	of Assessment	Description of Assess	sment	Maximur Marks	n		Reso	urces Requ	iired		External / Internal
1	Laboratory 7	Test by observation	Examiner will ask to stu take reading and then ca in front of him and will a correctness of result	lculate	10			F	Rating Scale			External
			ADDITIONAL INSTRU	CTIONS FOR	R THE HO	)D/ FA	CULTY	Y (IF A	NY)			
				Nil								

RG	PV (Diploma	a Wing ) Bhopal	SCHEME FOR L OUTCOM		Bı	anch Co	ode	Cou	rse Code	CO Code	LO Code	Format No. 4
					C	0	2			2	1	
OURS	E NAME	PROCESS HEAT TRAN	SFER		I				I			
CO Des	scription	Student will be able	to understand principle of h	eat flow in fluid	and funda	mentals	of conn	ective h	eat transfer.			
LO Des	cription	Student will be ab	le to explain theory of heat	flow in fluid.								
			<u> </u>	SCHEME OF	STUDY							
S. No.	Learnii	ng Content	Teaching –Learning Method	Desc	ription of Process	T-L		Feach Hrs.	Pract. /Tut Hrs	LRs	Require	d Remarks
1	-	heat exchanging flow pattern, length curve, rate of er, heat flux, and	Method	Faculty will content. Flow pattern exchanger an heat exchange in lab, temp draw by stuc students wea will be given remedial and taken.	of double ad shell an ger are de length cur lents. To kness ass and acco l tutorials	e pipe he id tube nonstrative will l dentify gnment rdingly will be	e be	6	2	text han	douts, verpoint,	S,
	1		SCH	IEME OF AS	SESSME	NT						
S. No.	Method	of Assessment	Description of Assess	sment	Maximu Marks	m		Reso	ources Requ	iired		External / Internal
1	Theory Exam	1	Theory questions related learned content will be a the university question p	isked in	05			Q	uestion pape	er		External
		·	ADDITIONAL INSTRU	<b>JCTIONS FO</b>	R THE I	IOD/ FA	ACULT	ΓY (IF .	ANY)		I	
				Nil								

		~	OUTCON	LEARNING ME	B	anch C	ode	Cou	rse Code		CO Code	LO Code	Format No. 4
					С	0	2	_			2	2	
-	RANS	SFER			I					I			
e	ablet	to understand p	principle of h	eat flow in flui	d and fund	amentals	s of con	nective h	eat transf	er.			
t	e able	e to calculate b	basic param	eter of heat ex	changing	equipme	ent desi	gn.					
			S	SCHEME O	F STUDY								
		Teaching – Metł		Dese	cription of Process	T-L		Teach Hrs.	Prac /Tut H		LRs I	Requir	ed Remarks
r l la zia	alpy and heat tion dual ctor, nple	Traditional L Method		Faculty wil content. To identify assignment accordingly tutorials wi	students v will be giv remedial Il be arrang	veakness ven and and ged.	5	8	3		text hand	erpoint	,
				IEME OF AS									External /
		Descriptio	on of Assess	sment	Marks			Reso	ources Re	equir	ed		Internal
		Theory quest learned conte the university	ent will be a	asked in	15			Q	uestion p	aper			External
		ADDITIONA	AL INSTRU	UCTIONS FO	OR THE I	IOD/ F	ACUL	ГY (IF	ANY)				
				Nil									
		Theory quest learned conte the university	ent will be a y question p	l to the asked in paper U <b>CTIONS FO</b>	15	5	ACUL	Q		-	ed		

RG	PV (Diploma	Wing ) Bhopal	SCHEME FOR L OUTCOM		Br	anch Co	ode	Cou	rse Code	CO Code	LO Code	Format No. <b>4</b>
					C	0	2			2	3	
COURS	E NAME	PROCESS HEAT TRAN	SFER		I							
CO Des	scription	Student will be able	to understand principle of h	eat flow in fluid	and funda	mentals	of conn	ective h	eat transfer.			
LO Des	cription	Student will be abl	e to understand theory and	l design equati	on of heat	exchang	ging eq	uipmen	ts.			
			S	SCHEME OF	STUDY							
S. No.	Learnii	ng Content	Teaching –Learning Method		ription of Process	T-L		leach Hrs.	Pract. /Tut Hrs	LRs	Require	d Remarks
1	forced conv forced con flow, Ditte Sieder-Tate convection, transfer in heat transfe	boundary layer, w heat transfer by ection in tubes, by vection in tubuler us-Bolter equation, equation, natural equation for heat natural convection, or from condensing wise and film type n.		Faculty will content. To identify s assignment w accordingly n tutorials will Drop wise an condensation in lab.	tudents w vill be giv remedial a be arrang nd film typ n will be d	eakness en and nd ed. oe emonstra	ate	8	2	text han	douts, verpoint,	S,
			SCH	IEME OF ASS	SESSME	NT						
S. No.	Method	of Assessment	Description of Assess	sment	Maximu Marks	n		Reso	urces Requ	iired		External / Internal
1	Paper-Pen Te	st	Theory question (includi simple numerical proble related to the learned con will be asked in the test	m) ntent	10		,	Test Pa	per + Rating	g Scale		Internal
	·		ADDITIONAL INSTRU	<b>JCTIONS FO</b>	R THE H	OD/ FA	CULI	Y (IF	ANY)			
				Nil								

RG	SPV (Diplom	a Wing ) Bhopal	SCHEME FOR L OUTCOM		Br	anch Co	ode	Cou	rse Code	CO Code	LO Code	Format No. 4
					С	0	2			2	4	-
OURS	E NAME	PROCESS HEAT TRAN	VSFER						I			1
CO Des	scription	Student will be able	e to understand principle of h	eat flow in fluid	and funda	mentals	of conr	ective h	eat transfer.			
LO Des	scription	Student will be ab	ble to evaluate individual he	at transfer coe	fficient in	natural	and fo	rced cor	vection in g	given se	tup.	
			S	SCHEME OF	STUDY							
S. No.	Learn	ing Content	Teaching –Learning Method		ription of Process	T-L		Feach Hrs.	Pract. /Tut Hrs	LRs	Requir	ed Remarks
1	Perform in	laboratory	Lab-demonstration	Faculty will perform in la how to take no observation a rate of heat t conductivity how these da an equipmen	b and der readings. I are use to ransfer an faculty w ta are use	nonstrate How the calculate d therma	se e al in		12	setu	nual	ab
			SCH	EME OF ASS	SESSME	NT				I		
S. No.	Method	of Assessment	Description of Assess	sment	Maximu Marks	n		Reso	ources Requ	iired		External / Internal
1	Laboratory 7	Fest by observation	Faculty will ask to stude take reading and then ca in front of him and will a correctness of result	lculate	15			ŀ	Rating Scale			Internal
			ADDITIONAL INSTRU	<b>JCTIONS FO</b>	R THE H	OD/ FA	CUL	ГY (IF .	ANY)			
				Nil								

RG	PV (Diplom	a Wing ) Bhopal		SCHEME FOR L OUTCOM		Bra	anch C	Code	Cou	ırse Code	CO Code	LO Code	Format No. 4
						С	0	2			3	1	
COURS	E NAME	PROCESS HEAT TRA	NSFER	·						· ·			
CO Des	scription	Student will be abl	e to unde	erstand thermal radiation a	nd radiation I	neat transfer.							
LO Des	cription	Student will be a	ble to ex	plain theory of radiation a	and solve ba	sic problem.							
				SCHI	EME OF ST	UDY							
S. No.	Learni	ng Content		Teaching –Learning Method	I	ption of T-l Process	Ĺ	Teac Hrs		Pract. /Tut Hrs	s. LRs	Require	ed Remarks
1	length and radiant ener energy, emi Wien's disp reflection ar Blackbody, radiation, radiation fi kirchhoff's body. Exchange o	2	in of radiant k's law orption, body law urface, gray	Traditional Lecture Method	be given a remedial a will be arra	ontent. y students assignment y nd according nd tutorials anged.			8	2	text hand	douts, verpoint,	,
	1			SCHEMI	E OF ASSE	SSMENT							
S. No.	Method	of Assessment	De	escription of Assessment		Maximu Marks				Resources l	Require	d	External / Internal
1	Paper-Pen Te	est	nume learn	bry question (including sine erical problem) related to ed content will be asked in paper	the	15			Test	Paper + Rat	ing Scal	e	Internal
		· · · ·		ITIONAL INSTRUCTI	ONS FOR	<b>FHE HOD</b> /	FACU	JLTY	( <b>IF</b> A	ANY)			
					Nil								

RGPV (Diploma Wing ) Bhopal		SCHEME FOR L OUTCOM				de	Course Code			LO Code	Format No. <b>4</b>	
	OUDSE NAME					0	2			3	2	
COURSI	E NAME	PROCESS HEAT TRAN	ISFER		I	1	1		I			
CO Des	cription	Student will be able	e to understand thermal radia	tion and radiati	ion heat tra	nsfer.						
LO Des	cription	Student will be ab	le to evaluate Stefan-Boltz	mann law cons	stant in giv	en setup	).					
			S	<b>SCHEME OF</b>	STUDY							
S. No.	Learning Content		Teaching –Learning Method	Description of T-L Process				TeachPract.Hrs./Tut Hrs.		LRs	Require	ed Remarks
1	Perform in laboratory		Lab-demonstration	Faculty will perform in la how to take observation rate of heat t conductivity how these da an equipmen	ab and dem readings. H are use to c ransfer and faculty wi ata are use at.	se l l in		6	Setu Mar Vid	nual	ıb	
			SCH	EME OF AS	SESSMEN	T						
S. No.	Method	of Assessment	Description of Assess	ment	Maximur Marks	Maximum Marks			urces Requ	iired		External / Internal
1	Laboratory Test by observation Examiner will ask to studen take reading and then calcu in front of him and will ass correctness of result		culate 10				R	Rating Scale		E		
	·		ADDITIONAL INSTRU	<b>CTIONS FO</b>	R THE H	OD/ FA	CULI	Y (IF A	ANY)			
				Nil								

RGPV (Diploma Wing ) Bhopal		SCHEME FOR L OUTCOM				ode	Cou	rse Code	CO LO Code		Format No. <b>4</b>		
						0	2			3	3		
COURS	E NAME	PROCESS HEAT TRAN	ISFER		I				I	1			
CO Des	cription	Student will be able	e to understand thermal radia	tion and radiati	ion heat tra	nsfer.							
LO Des	cription	Student will be ab	le to evaluate emissivity of	plate in given	setup.								
			S	SCHEME OF	STUDY								
S. No.	Learni	ng Content	Teaching –Learning Method	Description of T-L Process				FeachPract.Hrs./Tut Hrs.		S. LRs	Require	ed Remarks	
1	1 Perform in laboratory		Lab-demonstration	Faculty will perform in la how to take observation rate of heat t conductivity how these da an equipmen	ab and dem readings. H are use to o ransfer and faculty winta are use at.	se e al in		6	setu Mar Vide	nual	ıb		
			SCH	EME OF AS	SESSMEN	T							
S. No.	Method	of Assessment	Description of Assess	sment	Maximur Marks	Maximum Marks			urces Requ	uired		External / Internal	
1	Laboratory T	Laboratory Test by observation Faculty will ask to students t take reading and then calcula in front of him and will asses correctness of result		lculate	e 05			Rating Scale				Internal	
			ADDITIONAL INSTRU	UCTIONS FO	R THE H	OD/ FA	CULT	ΓY (IF Δ	ANY)				
				Nil									

RGPV (Diploma Wing ) Bhopal			IE FOR LEARNING OUTCOME			Branch Code		Cou	Course Code		CO Code	LO Code	Format No. <b>4</b>	
					С	0		2				4	1	
OURS	E NAME	PROCESS HEAT TRAN	ISFER		I		1			I	I		·	
CO Des	scription	Student will be able	e to understand and analyze h	neat exchanging	g equipmer	ts.								
LO Des	scription	Student will be at	le to understand working a	nd able to desi	gn double	pipe he	eat e	excha	nge.					
			S	SCHEME OF	STUDY									
S. No.	Learni	ng Content	Teaching –Learning Method	Desc	escription of T-L Process			Teacl Hrs.		Pract. /Tut Hrs.		LRs Required		ed Remarks
	on funct arrangement working of exchanger calculation	eat exchanger based ion and flow t, construction and f double-pipe hea simple problems o of length, area, rate asfer, simple design	Method I I f e n	content. To identify students weak assignment will be given accordingly remedial and tutorials will be arranged Double-pipe heat exchang construction will be demonstrate in lab studen prepare a note on it.		Il be given and medial and e arranged. eat exchanger fill be a lab student will on it.		ss d		3 2		Suggested text books, handouts, powerpoint, videos		
S. No.	Method	of Assessment	Description of Assess		AE OF ASSESSMENT Ent Maximum Marks			<b>Resources Required</b>						External / Internal
1	Theory Exam	ory Exam Theory questions related to learned content will be ask the university question pap		sked in	ked in 10					Question paper				
			ADDITIONAL INSTRU	JCTIONS FO	R THE H	OD/ F	FAC	ULT	Y (IF	ANY)				
				Nil										

RGPV (Diploma Wing ) Bhopal		SCHEME FOR L OUTCOM				ode	Course Code			LO Code	Format No. 4	
					C	0	2			4	2	
COURS	E NAME	PROCESS HEAT TRAN	ISFER				-					
CO Des	scription	Student will be able	to understand and analyze h	ieat exchanging	equipmen	ts.						
LO Des	scription	Student will be ab	le to understand working a	nd able to desi	gn 1 - 1 ar	d 1 - 2 s	shell an	d tube l	heat exchang	ger.		
			S	SCHEME OF	STUDY							
S. No.	Learnir	ng Content	Teaching –Learning Method	Desc	ription of Process		'each Hrs.	Pract. /Tut Hrs	. LRs	Require	d Remarks	
1	and 1-2 sh exchange, he tube pitch, t shell, correc	a and working of 1-1 ell and tube heat eat exchanger tubes tube layout, baffles extion of LMTD for plate type heat extended surface simple design	Method	Faculty will explain lear content. To identify students were assignment will be given accordingly remedial and tutorials will be arrange Shell and tube heat exch construction will be demonstrate in lab stude prepare a note on it. Heat transfer in fin will demonstration lab.			8 2			Suggested text books, handouts, powerpoint, videos		3,
			SCH	EME OF AS	SESSMEN	IT						
S. No.	Method o	of Assessment	Description of Assess	sment	Maximur Marks	n		Reso	urces Requ	ired		External / Internal
1	Theory Exam		Theory questions related to the learned content will be asked in the university question paper			10 Question				paper Ext		
		I	ADDITIONAL INSTRU	<b>JCTIONS FO</b>	R THE H	OD/ FA	CULT	Y (IF	ANY)			
				Nil								

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME		Bra	Branch Code		Course Code		CO Code	LO Code	Format No. 4	
	OURSE NAME					0	2			5	1	
COURS	E NAME	PROCESS HEAT TRANS	FER		I		1		I	1		
CO Des	scription	Student will be able	to understand and analyze e	evaporators.								
LO Des	scription	Student will be able	e to explain theory of evap	oorator.								
			S	SCHEME OF	STUDY							
S. No.	Learning Content		Teaching –Learning Method	Description of T-L Process				TeachPraHrs./Tut		LRs Required		ed Remarks
1	single and evaporator, elevation, enthalpy con construction following horizontal t	boiling point Duhring's rule, ncentration diagram, and working of evaporators (a) ube, (b) calandriya ng tube vertical, (d)	Traditional Lecture Method	Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged. Single effect evaporator construction details will be demonstrate in lab student will prepare a note on it. HEME OF ASSESSMENT			8		text bo handouts, powerpoi videos		S,	
S. No.	Method	of Assessment	Description of Assess			Maximum			ources Requ		External / Internal	
1	Theory Exam		Theory questions related learned content will be a the university question p	sked in	10			Question paper				External
	'	I	ADDITIONAL INSTRU	JCTIONS FO	R THE H	OD/ FA	CULT	Y (IF	ANY)		I	
				Nil								

-	to understand and analyze e e to calculate parameter re S	quired for eva	<i>C</i>	0	2			5	2	
Student will be able	to understand and analyze e e to calculate parameter re S	quired for eva	porator de							
Student will be able	e to calculate parameter re S	quired for eva	porator de							
· · · · · · · · · · · · · · · · · · ·	S	<b>A</b>	porator de							
earning Content		CUEME OF	1	esign.						
earning Content	Teaching Learning	CHEME OF	<b>STUDY</b>							
	Method					`each Hrs.	Pract. /Tut Hrs	LRs	Required	l Remarks
Enthalpy balance (single effect), performance of tubular evaporator, capacity, economy, area, methods of feeding to multiple effect evaporator, design calculation for single effect (area, economy and capacity)		Faculty will explain learning content. To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged.						handouts,		,
	SCH	EME OF AS	SESSME	NT						
thod of Assessment	Description of Assess	sment Maximum Marks				Reso		External / Internal		
learned content will be as		sked in	10			Qı	Question paper			External
· · · · · ·	ADDITIONAL INSTRU	CTIONS FO	OR THE H	IOD/ FA	<b>ACUL</b> T	Y (IF A	ANY)			
		Nil								
1 1 t	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y) hod of Assessment Exam	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y) to be the second se	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify a assignment accordingly tutorials willSCHEME OF AShod of AssessmentDescription of AssessmentExamTheory questions related to the learned content will be asked in the university question paperADDITIONAL INSTRUCTIONS FOR	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify students w assignment will be give accordingly remedial tutorials will be arranged SCHEME OF ASSESSMEhod of AssessmentDescription of AssessmentMaximu MarksExamTheory questions related to the learned content will be asked in the university question paper10ADDITIONAL INSTRUCTIONS FOR THE H	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged.SCHEME OF ASSESSMENThod of AssessmentDescription of AssessmentMaximum MarksExamTheory questions related to the learned content will be asked in the university question paper10ADDITIONAL INSTRUCTIONS FOR THE HOD/ FA	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged.SCHEME OF ASSESSMENThod of AssessmentDescription of AssessmentMaximum MarksExamTheory questions related to the learned content will be asked in the university question paper10ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULT	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged.SCHEME OF ASSESSMENThod of AssessmentDescription of AssessmentMaximum MarksResoExamTheory questions related to the learned content will be asked in the university question paper10QuADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF A	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged.Image: Content of the tutorials will be arranged.SCHEME OF AssessmentMaximum MarksResources RequScheme of tutorials will be arranged.Image: Content will be asked in the university questions related to the learned content will be asked in the university question paperMaximum MarksQuestion papeADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged.hand opon yoidSCHEME OF ASSESSMENTMaximum MarksResources RequiredPost of AssessmentMaximum MarksQuestion paperADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)	ator, capacity, economy, methods of feeding to e effect evaporator, calculation for single (area, economy and y)To identify students weakness assignment will be given and accordingly remedial and tutorials will be arranged.Image: Content of the powerpoint, videosSCHEME OF SSESSMENThod of AssessmentDescription of AssessmentMaximum MarksResources RequiredExamTheory questions related to the learned content will be asked in the university question paper10Question paperCOLDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)