RGPV (DI		OMA W PAL	ING)		CULUM FOR THE OURSE	FORMA	T-3	Sheet No. 1/3			
Branch			C	ement Technolog	y	Semester	,	V			
Course Co	de	50	3	Course Name	Heat and	d Mass Tran	sfer				
Course Out	tcom	ne 1	Studer		describe the heat t	ransfer by	Teach Hrs Marks				
Learning O	Student will be able to state the basic concepts of heat transfer by conduction.										
Contents	Contents Modes of heat transfer, Conduction, Fourier's law, thermal conductivi thermal resistance and conductance, Fourier heat conduction equation, form in rectangular, cylindrical and spherical coordinates. Analogy betwee flow of heat and electricity, combined heat transfer Process.										
Method of	Asse	essment		pen test	•						
Learning O	Outco	ome 2	Studer		o solve the problems	s based on	08	10			
Contents			spherio insulat	cal shells and c	steady state conductomposite structures, pipes. Effects of value ween flow of heat and	thermal instriable therm	ulation,	critical			
Method of	Asse	essment		y exam							
Learning O	Outco	ome 3	condu		perform the practical material and heat trans		08	10			
Contents				al conductivity of ransfer through cor	different materials. nposite walls.						
Method of	Asse	essment	Labora	atory test by observ	ation						
Course Out	tcom	ne 2		nt will be able to deduction).	escribe the mechanism	of heat flow	Teach Hrs	Marks			
Learning O	Outco	ome 1			erive the equation for hic mean temperature di		10	10			
Contents			Heat transferand pa	transfer by convector, logarithmic meant allel current flow	etion, natural and force an temperature differences, Energy balances, indicance form of overall he	ced convection nce (LMTD), lividual, film	counter	current rall heat			
Method of	<u>Ass</u> e	essment	Theory	y exam							
Learning O	utco	ome 2			lescribe the heat transf	er with and	08	10			
Without phase change. Heat transfer with phase change, heat transfer without phase change, regime of heat transfer in fluids, thermal boundary layer, drop-wise condensation film-wise condensation, heat transfer to boiling liquids, pool boiling saturated liquid.											

Method of Assessment	Quiz		
Learning Outcome 3	Student will be able to solve the problems based on heat flow in fluids.	08	10
Contents	Find out the rate of heat transfer, area of heat transfer, lot temperature difference. Counter current and parallel current for overall heat transfer coefficient.	_	
Method of Assessment	Theory exam		
Course Outcome 3	Student will be able to explain the fundamental concepts of radiation and heat exchangers.	Teach Hrs	Marks
Learning Outcome 1	Student will be able to specify the fundamental concepts of radiation.	08	10
Contents	Radiant heat transfer, absorptivity, reflectivity and transmi black body radiation, Kirchhoff's law, Stefan Boltzma displacement law, radiation between surfaces, view facto coefficient, numerical based on radiation.	nn law,	Weins
Method of Assessment	Theory exam		
Learning Outcome 2	Student will be able to categorize the heat exchangers according to the flow of fluids.	08	10
Contents	Heat exchangers, double pipe heat exchanger, shell and tube heat transfers coefficient, Fouling factors, method of heat exchanger and Condensers, effectiveness of heat exchanger, exchanger.	changer a	analysis,
Method of Assessment	Theory exam		
Learning Outcome 3	Student will be able to perform the experiment on heat exchangers.	06	10
Contents	Double pipe heat exchanger, shell and tube heat exchange coefficient, Fouling factors.	er, heat t	ransfers
Method of Assessment	Laboratory test by observation		
Course Outcome 4	Student will be able to identify the role of diffusion and absorption in mass transfer operation.	Teach Hrs	Marks
Learning Outcome 1	Student will be able to state the theory of diffusion,	08	10
Contents	absorption and analogy between heat and mass transfer.		
	Diffusion and mass transfer between phases, Diffusivity coefficient, film theory, Molecular and turbulent difficoefficient, Fick's Law, Diffusivity, Analogy between heat at Absorption, theory of absorption.	usion, c	liffusion
Method of Assessment	Diffusion and mass transfer between phases, Diffusivity coefficient, film theory, Molecular and turbulent diffusion, Fick's Law, Diffusivity, Analogy between heat and turbulent and turbulent and turbulent diffusivity.	usion, c	liffusion
Method of Assessment Learning Outcome 2	Diffusion and mass transfer between phases, Diffusivity coefficient, film theory, Molecular and turbulent difficoefficient, Fick's Law, Diffusivity, Analogy between heat at Absorption, theory of absorption.	usion, c	liffusion
	Diffusion and mass transfer between phases, Diffusivity coefficient, film theory, Molecular and turbulent diffusivity, Fick's Law, Diffusivity, Analogy between heat at Absorption, theory of absorption. Theory exam Student will be able to perform the experiment on emissivity	usion, c	liffusion transfer,

Learning Outcome 3	Student will be able to prepare a report on different	08	10
	equipments used for absorption and follow the safety		
	precautions during experiments.		
Contents	Equipment for gas-liquid operations, Bubble columns, tray	towers,	packed
	towers. Instructions related with maintenance of cle experiments.	anliness	during
Method of Assessment	Laboratory test by observation		
Course Outcome 5	Student will be able to describe the mass transfer by	Teach	Marks
	distillation and drying.	Hrs	TVICTIES
Learning Outcome 1	Student will be able to draw vapour-liquid equilibrium diagram and explain the mass transfer by distillation.	08	10
Contents	Distillation, concept of distillation, vapour phase equilibrium equilibrium diagram, batch distillation, continuous distillation, problems on the same.		
Method of Assessment	Theory exam		
Learning Outcome 2	Student will be able to understand the general principle of humidification and de-humidification.	08	10
Contents	Purpose of drying, humidification and de-humidification, g properties of air-moisture mixture, problems on the same.	eneral p	rinciple,
Method of Assessment	Paper pen test		
Learning Outcome 3	Student will be able to prepare a report on cooling towers	08	10
_	and driers.		
Contents	Study of:-		
	Cooling towers. Tray drier. Rotary drier. Fluidized bed drier.		
Method of Assessment	Laboratory test by observation		

D CDV (D: 1	WE ARE A COMPLETED A FARMING OVERGOLD		Branch Cod			Course Code			CO Code	LO Code	
RGPV (Diploma Wing) Bhopal SCHEME FOR LEARNING OUTCOME		C	0	1	5	0	3	1	1	Format No. 4	
COURSE NAME	Heat and Mass	at and Mass transfer									
CO Description	Student will be	able to describe the heat transfer by conduction	1.								
LO Description	Student will be	dent will be able to state the basic concepts of heat transfer by conduction.									

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Modes of heat transfer, Conduction,	Interactive classroom	Teacher will explain the	10	NIL	Handouts,	NIL
	Fourier's law, thermal conductivity,	teaching, demonstration,	contents and provide			chalk	
	thermal resistance and conductance,	quiz, assignments.	handouts to students.			board,	
	Fourier heat conduction equation, its		Teacher will conduct			PPT, text	
	form in rectangular, cylindrical and		assignments/ quiz to			book,	
	spherical coordinates. Analogy between		make students practice			charts.	
	flow of heat and electricity, combined		their knowledge.				
	heat transfer Process.		_				

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Paper pen test	Student will be asked to describe the basic concepts of conduction.	10	Test paper + rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Progressive – I

D CDV (D)				Branch Code			urse (Code	CO Code	LO Code	
RGPV (Diploma	Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	C	0	1	5	0	3	1	2	Format No. 4
COURSE NAME	Heat and Mass	eat and Mass transfer									
CO Description	Student will be	able to describe the heat transfer by conduction	۱.								
LO Description	Student will be	udent will be able to solve the problems based on conduction.									

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Linear one-dimensional steady state	Interactive	Teacher will explain the	08	NIL	Handouts, chalk	NIL
	conduction through a slab, tubes,	classroom	contents and provide handouts			board, PPT, text	
	spherical shells and composite	teaching,	to students. Teacher will			book, charts.	
	structures, thermal insulation, critical	demonstration,	conduct assignments/ quiz to				
	insulation thickness for pipes. Effects	quiz, assignments.	make students practice their				
	of variable thermal conductivity,		knowledge.				
	derivation of analogy between flow of						
	heat and electricity.						

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Theory exam	Students will be asked to solve the numerical problems based on conduction.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

DCDV (D' 1 W') DL I GCHENTE			Branch Code			Course Code			CO Code	LO Code	F (N. 4)
RGPV (Diploma	Wing) Bhopal	CHEME FOR LEARNING OUTCOME C		0	1	5	0	3	1	3	Format No. 4
COURSE NAME	Heat and Mass	and Mass transfer									
CO Description	Student will be	dent will be able to describe the heat transfer by conduction.									
LO Description	Student will be	lent will be able to perform the practical on thermal conductivity of different material and heat transfer through composite walls.									

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Thermal conductivity of different materials. Heat transfer through composite walls.	hands on practice, lab	Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	02	06	Handout/ lab manual, text book, charts, video film.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Ass	essment		Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Laboratory observation	test	by	Students will be asked to study about the thermal conductivity of different material and heat transfer through composite walls.	10	Observation schedule/check-list /rating scales /rubrics	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of End practical exam

DCDV (D' 1	m. Di i	COMENTE POD I EA DAINIG OMECOME				Course Code			CO Code	LO Code	
RGPV (Diploma	RGPV (Diploma Wing) Bhopal SCHEME FOR LEARN		C	0	1	5	0	3	2	1	Format No. 4
COURSE NAME	Heat and Mass	t and Mass transfer									
CO Description	Student will be	ent will be able to describe the mechanism of heat flow in fluids (convection).									
LO Description	Student will be	will be able to derive the equation for heat transfer coefficient and logarithmic mean temperature difference.									

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Heat transfer by convection, natural and forced convection, rate of heat transfer, logarithmic mean temperature difference (LMTD), counter current and parallel current flows, Energy balances, individual, film and overall heat transfer coefficient, resistance form of overall heat transfer coefficient.	Interactive classroom teaching, tutorial, quiz, assignments.	Teacher will explain the		NIL	Handouts, chalk board, PPT, text book, charts, video film.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Theory exam	Students will be asked to derive the equation for heat transfer coefficient and logarithmic mean temperature difference and explain the convection.		Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

DCDV/D'	1177) DI I			Branch Code			urse	Code	CO Code	LO Code	
RGPV (Diploma	a Wing) Bhopal SCHEME FOR LEARNING OUTCOME		C	0	1	5	0	3	2	2	Format No. 4
COURSE NAME	Heat and Mass	eat and Mass transfer									
CO Description	Student will be	tudent will be able to describe the mechanism of heat flow in fluids (convection).									
LO Description	Student will be	ident will be able to describe the heat transfer with and without phase change.									

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Heat transfer with phase change, heat transfer without phase change, regimes of heat transfer in fluids, thermal boundary layer, drop-wise condensation, film-wise condensation, heat transfer to boiling liquids, pool boiling of saturated liquid.	teaching, tutorial, quiz,	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Quiz	Students will be asked to describe the heat transfer with and without phase change.	10	Rubrics/rating scales	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Term Work

DCDV (D' 1	177 \ D1 1	COMENTE POD I EA DAINIG OMECOME				Course Code			CO Code	LO Code	
RGPV (Diploma Wing) Bhopal SCH		SCHEME FOR LEARNING OUTCOME	C	0	1	5	0	3	2	3	Format No. 4
COURSE NAME	Heat and Mass	at and Mass transfer									
CO Description	Student will be	dent will be able to describe the mechanism of heat flow in fluids (convection).									
LO Description	Student will be	ent will be able to solve the problems based on heat flow in fluids.									

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Find out the rate of heat transfer, area of heat transfer, logarithmic mean temperature difference. Counter current and parallel current flows, calculation of overall heat transfer coefficient.	teaching, tutorial, quiz, assignments.	1	08	NIL	Handouts, chalk board, PPT, text book, charts, video film.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Theory exam	Students will be asked to solve the problems based on heat flow in fluids.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal			Bran	nch C	ode	Co	urse	Code	CO Code	LO Code	
RGPV (Diploma	Wing) Bhopal SCHEME FOR LEARNING OUTCOME		C	0	1	5	0	3	3	1	Format No. 4
COURSE NAME	Heat and Mass	eat and Mass transfer									
CO Description	Student will be	able to explain the fundamental concepts of rac	diation	and l	neat e	xchai	ngers.				
LO Description	Student will be	udent will be able to specify the fundamental concepts of radiation.									

S. No.	Learning Content	Teaching —Learnin Method	g Description of T-L Process	Teach Pract. /Turner. Hrs.	t LRs Required Remarks
1.	Radiant heat transfer, absorptivity, reflectivity and transmissivity, Laws of black body radiation, Kirchhoff's law, Stefan Boltzmann law, Weins displacement law, radiation between surfaces, view factors, heat transfer coefficient, numerical based on radiation.	teaching, qui	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.		Handouts, chalk board, PPT, text book and video films.

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Theory exam	Students will be asked to specify the fundamental concepts of radiation.	10	Question paper + rating scale	External

${\bf ADDITIONAL\ INSTRUCTIONS\ FOR\ THE\ HOD/\ FACULTY\ (IF\ ANY)}$

D CDV (D)	****		Brai	nch C	ode	Co	urse	Code	CO Code	LO Code	
RGPV (Diploma	Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	C	0	1	5	0	3 3		2	Format No. 4
COURSE NAME	Heat and Mass	eat and Mass transfer									
CO Description	Student will be	tudent will be able to explain the fundamental concepts of radiation and heat exchangers.									
LO Description	Student will be	Student will be able to categorize the heat exchangers accord					•				

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Heat exchangers, double pipe heat exchanger, shell and tube heat exchanger, heat transfers coefficient, Fouling factors, method of heat exchanger analysis, Evaporator and Condensers, effectiveness of heat exchanger, Finned tube heat exchanger.	teaching, lab demonstration,	Teacher will explain the contents and provide handouts to students. Teacher will conduct assignments/ quiz to make students practice their knowledge.	08	NIL	Handouts, chalk board, PPT, text book, charts, video film, Models.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Theory exam	Students will be asked to categorize the heat exchangers according to the flow of fluids, evaporators and condensers.	10	Test paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

DCDV/D: I	***		Branch Code Course Code CO Cod	CO Code	LO Code	Form at No. 4					
RGPV (Diploma	Wing) Bhopai	SCHEME FOR LEARNING OUTCOME	<i>C</i>	0	1	5	0	3	3	3	Format No. 4
COURSE NAME	Heat and Mass	leat and Mass transfer									
CO Description	Student will be	udent will be able to specify the fundamental concepts of radiation and heat exchangers.									
LO Description	Student will be able to perform the experiment on heat exchangers.										

S. No.	Learning Content	t Teaching – Description of T-L Process			Pract. /Tut Hrs.	LRs Required	Remarks
1.	Double pipe heat exchanger, shell and tube heat exchanger, heat transfers coefficient, Fouling factors.	hands on practice, lab		NIL	06	Handout/ lab manual, text book, charts, video film.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Ass	essment		Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Laboratory observation	test	by	Students will be asked to perform the experiment on heat exchangers.	10	Observation schedule/check-list /rating scales /rubrics	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end practical exam

DODY	(D' 1	W Dl 1	COHEME EO	OR LEARNING OUTCOME			ch Cod	le C	ourse	Code	CO Code	L	O Code	
KGPV	(Diploma	Wing) Bhopal	SCHEME FO			C	0	1 5	0	3	4		1	Format No. 4
COURS NAME							'	'			1		'	
CO Des	scription	Student will be	nt will be able to identify the role of diffusion and absorption in mass transfer operation.											
LO Des	scription	Student will be	able to state the	theory of diffusi	ion, absorptio	n and an	alogy l	oetweer	heat a	and ma	ss transfer.			
SCHEN	ME OF ST	UDY												
S. No.	Learning	g Content		Teaching Method	0	Descript Process	ion	of T		Teach Hrs.	Pract. Hrs.	/Tut	LRs Required	Remarks
1.	Diffusion		ansfer between	Interactive	classroom	Teacher	will e	xplain	the 0	8	NIL		Handouts,	NIL
	phases,	<i>J</i> /	mass transfer	teaching,		contents	and	1					chalk	
	confficion	nt film theory	Molecular and	demonstration,	quiz, 📑	handouts	to	studer	nts.				board,	
		diffusion, diffus		assignments.	1 /	Teacher	will						PPT, tex	

SCHEME OF ASSESSMENT

Fick's Law, Diffusivity, Analogy

between heat and mass transfer,

Absorption, theory of absorption.

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Theory exam	Student will be asked to explain the theory of diffusion, absorption and analogy between heat and mass transfer.	10	Question paper + rating scale	External

assignments/ quiz to

make students practice

their knowledge.

book,

charts,

video film, Models.

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	Branch Code	Course Code	CO Code	LO Code	
----------------------------	-----------------------------	--------------------	--------------------	---------	---------	--

			C	0	1	5	0	3	4	2	Format No. 4
COURSE NAME	Heat and Mass	s transfer									
CO Description	Student will be	tudent will be able to identify the role of diffusion and absorption in mass transfer operation.									
LO Description	Student will be	Student will be able to perform the experiment on emissivity of solids, diffusivity of gases.									

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Pract. /Tut Hrs. Hrs.	LRs Required	Remar ks
1.	Emissivity of solids. Diffusivity of gases.	Lab demonstration, hands on practice, lab assignments, quiz, assignments,	Teacher will demonstrate the procedure of lab experiments. The students will learn through practice.	NIL 06	Handouts, chalk board, PPT, text book, charts, video film.	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Asse	essment		Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Laboratory observation	test	by	Students will be asked to perform experiment on emissivity of solids, diffusivity of gases.	10	Observation schedule/check-list /rating scales /rubrics	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of end practical exam

DCDV (Diploma Wing) Phonal SCHEME EC						Branch Code Cours			urse Code		CO Code	LO Code	E 4 N 4	
RGPV	RGPV (Diploma Wing) Bhopal SCHEME FO			R LEARNING OUTCOME		0	1	5	0	3	4	3	Format No. 4	
COURS NAME		Heat and Mas	s transfer		'								1	
CO Des	scription	Student will be	able to identify	the role of diffusion and ab	sorption i	in mass	trans	sfer o _l	perati	on.				
LO Des	cription	Student will be	able to prepare	a report on different equipr	nents used	d for ab	sorpt	ion aı	nd fol	low th	ne safety preca	utions during	experiments.	
CCHEN	ME OF ST	UDY												
SCHEN														
S. No.	Learning	g Content		Teaching –Learning Method	Descri Proces		of	T-]		each rs.	Pract. //I	ut LRs Require	d Remarks	

quiz,

handouts to students.

make students practice

conduct

to

quiz

Teacher will

their knowledge.

assignments/

board,

book,

charts, video film,

Models.

PPT, text

demonstration,

assignments.

SCHEME OF ASSESSMENT

Instructions related with maintenance of

cleanliness during experiments.

towers.

S. No.	Method of Assessr	ment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	_	est by	Student will be asked to prepare a report on different		Observation	
1.	observation		equipments used for absorption and follow the safety	10	schedule/check-list	Internal
			precautions during experiments.		/rating scales /rubrics	

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of lab work

	C 0 1 5 0 3 5 1							
COURSE NAME	Heat and Mass transfer							
CO Description	Student will be able to describe the mass transfer by distillation and drying.							
LO Description	Student will be able to draw vapour-liquid equilibrium diagram and explain the mass transfer by distillation.							
SCHEME OF ST	TUDY							

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Distillation, concept of distillation,	Interactive classroom	Teacher will explain the	08	NIL	Handouts,	NIL
	vapour phase equilibrium, vapour-	teaching, lab demonstration,	contents and provide			chalk	
	liquid equilibrium diagram, batch	quiz, assignments.	handouts to students.			board,	
	distillation, continuous distillation,		Teacher will conduct			PPT, text	
	material balance, problems on the		assignments/ quiz to			book,	
	same.		make students practice			charts,	
			their knowledge.			video film,	
						Models.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Theory exam	Student will be asked to make vapour-liquid equilibrium diagram and explain the mass transfer by distillation.	10	Question paper + rating scale	External

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

D CDV (D) I W' \ DI			ich C	ode	Co	urse (Code	CO Code	LO Code	D . N 4
RGPV (Diploma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	C	0	1	5	0	3	5	2	Format No. 4

COURSE NAME	Heat and Mass transfer
CO Description	Student will be able to describe the mass transfer by distillation and drying.
LO Description	Student will be able to understand the general principle of humidification and de-humidification.

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1.	Purpose of drying, humidification and	Interactive classroom	Teacher will explain the	08	NIL	Handouts,	NIL
	de-humidification, general principle,	teaching, lab demonstration,	contents and provide			chalk	
	properties of air-moisture mixture,	quiz, assignments.	handouts to students.			board,	
	problems on the same.		Teacher will conduct			PPT, text	
			assignments/ quiz to			book,	
			make students practice			charts,	
			their knowledge.			video film,	
						Models.	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.	Paper pen test	Student will be asked to explain the general principle of humidification and de-humidification.	10	Question paper + rating scale	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Progressive - II

			C	0	1	5	0	3	5	3	Format No. 4
COURSE NAME	Heat and Mass transfer										
CO Description	Student will be	able to describe the mass transfer by distillation	n and	drying	ζ.						
LO Description	Student will be	able to prepare a report on cooling towers and	driers.								

S. No.	Learning Content	Teaching —Learning Method	Description of T-L Process		Pract. /Tut Hrs.	LRs Required	Remar ks
1.	Study of:- Cooling towers. Tray drier. Rotary drier. Fluidized bed drier.	Lab demonstration, hands on practice, lab assignments, quiz, assignments,		02	06	Handouts, chalk board, PPT, text book, charts, video film.	NIL

SCHEME OF ASSESSMENT

S. N	No. N	Method of Asse	ssment		Description of Assessment	Maximum Marks	Resources Required	External / Internal
1.		Laboratory observation	test	by	Students will be asked to prepare a report on cooling towers and driers.	10	Observation schedule/check-list /rating scales /rubrics	Internal

ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

Part of Lab Work

REFERENCE BOOKS:

- Heat Transfer, J. P. Holman, Ge, Tata McGraw-Hill Pub Co. Ltd.
- Heat Transfer P.K. Nag Tata McGraw-Hill Pub Co. Ltd.
- Heat and Mass Transfer S.P. Sukhatme
- Fundamentals of Engineering Heat and Mass Transfer R.C. Sachdeva.
- Engineering Heat Transfer Gupta & Prakash
- Unit Operations-II (Heat and Mass Transfer Operations) K. A. Gavhane