RGPV (DIPLOMAOBE CURRICULUM FOR THEWING) BHOPALCOURSE

FORMAT - **3**

Sheet No. 1/4

WIN	IG) BHC	PAL	C	OURSE	FURIVIAT -	1/4	
Branch	REF	RIGERA	TION AND AIR CO	NDITIONING ENGINEERIN	IG s	Semester	VI
Course	e Code	601	Course Name	HVAC LOAD ESTIM	IATION		
Course	Outcome 1	l Site	selection for a given a	air conditioning system		Teachi ng Hrs	Marks
Learnir	ng Outcom	e 1 Iden	tify suitable inside an litioning	d outside design conditions fo	or comfort air	4 hrs	5
Co	ntents	Class latitu wint Indi Insio	sification of Climate ude and months, weat er and summer, ASH an cities. Corrections de industrial design co	Zone, Climate zones of India ther data, Selection of inside a RAE recommended summer de to outdoor design Conditions	, outside desi and outside de esign conditio for time of day	gn data at esign cond ns, table y and Time	different itions for for major e of year,
Method	of Assessme	ent Prog	gressive Test - I		In	ternal	
Learnin	Learning Outcome		ain management of In	door Air Quality		7hrs	10
C	ontents	Mea Buil Fact Cha	ning and need of Ind ding Syndromes, Bui ors Affecting Attribunge, Air Velocity, cor	loor Air Quality (IAQ). Sour lding System Maintenance, Ro ites Of Indore Air, Improve itrols of IAQ.	ce of Indore enovation Act IAQ, Buildi	Air Pollut ivity, Air (ng Ventila	ant, Sick Cleaning, tion, Air
Method	of Assessme	ent Theo	ory Exam		Ex	ternal	
Learnin	g Outcom	Dete a 3 roofs, mater	rmine the overall Hea partitions, Ceilings ials	t transfer coefficient U for gives, Floors, Doors, and Window	ven for walls, ws for given	4hrs	5
C	ontents	Plann space Const Trans Wind heat	ing of work, Basic I Physical dimension truction materials, Cli mission Coefficients ows Cooling Load C	nformation, Building Location ns of space, Building Struct mate conditions. Define Occu U for Walls, Roofs, Partitic omponent, External and Interr	n, Orientation ctures, Specif pancy load, T ons, Ceilings, nal heat gains	of buildin ication of hermal con Floors, D sensible h	g, Use of building nductivity, oors, and eat, latent
Method	of Assessme	ent Prog	ressive Test - I		Int	ernal	
Course	e Outcome	2 Esti	mation of the solar he	at gain through glass		Teaching Hrs	Marks
Learnin	Learning Outcome		cribe fenestration, nee	ds, effect on air conditioning		8hrs	10
C	ontents	Distri gain t openi Overl Load Facto	bution of Solar radiat hrough ordinary glass ng, effect of shadin hangs, Fins and Adjac Temperature Diffe r(CLF) method,	ion, solar time, Solar radiati s, effect of tilt of glass on solar ng device, effect of sky h cent Buildings, Space heat gai erence(CLTD)/ Solar Cooli	on through fe gain, effect o aziness. Shao n and space c ng Load(SC	nestration, f orientation ling from ooling load L)/ Cooli	solar heat on of glass Reveals, d, Cooling ng Load

Method of A	ssessmen	t The	ory Exam		Η	External	
RGPV (WING)	DIPLO BHOF	MA PAL	OBE CURRIC	CULUM FOR THE	FORM	AT - 3	Sheet No. 2/4
Branch	REFRI	GERA	TION AND AIR CONI	DITIONING ENGINEERING	Sem	ester	VI
Course Co	ode	601	Course Name	HVAC LOAD ESTIM	ATION		
Learning	g Outcom	ne 5	Calculate heat transfer	rate due to fenestration		7hrs	10
Со	ntents		Calculation of Transmis radiation - maximum So Solar Heat Gain Facto Different types of shadi gain through glass with windows glass with indo	sion heat gain through glass, and olar Heat Gain Factor (SHGF) a or (SHGF) for windows glass ing device and their coefficients and without shading devices, poor shading device using ASHR	nd by dire and Coolin with ind s, Over al Cooling RAE Fund	ect penet ng Load door sha ll factors load fac lamentals	ration of sola Factor (CLF) ding devices for solar hea tor (CLF) fo s.
Method o	of Assessm	ent	Theory Exam			Ext	ernal
Course	Outcome	e 3	Estimate heat transfer r CLTD/ETD method	rate for opaque surface using		Teachi Hrs	ing Marks
Learning	Outcom	e 6	Explain the general asp	ects of heat transfer through bu	ildings	7hrs	5
Cor	ntents		One-dimensional, stead roof Homogeneous wal Thermo-physical prope Surface or film conduc temperature	y and unsteady state heat transf ll, Non-homogeneous walls, O erties of some common build tance for air film, Thermal co	fer throug verall heading and ing and	h buildin at transfo insulati e of air	ngs, walls and er coefficient ng materials space, Sol-ai
Method of	Assessme	ent	Term Work		Inte	ernal	
Learning	Outcom	e 7	Calculate Sensible Hea	t Gain through Opaque Surface	;	8hrs	10
Со	ntents		Calculation of Overall h (CLTD) for walls and re lag and decrement factor rate with time for thick a groups referred in the 19	neat transfer coefficient, Cooling oofs. Equivalent CLTDs for D or with wall thickness and der and thin walls of building. (The 997 ASHRAE Fundamentals Ha	g Load T type of w isity, Var cLTD v andbook)	emperatu valls, Van iation of alues for	The Difference The content of time of heat transfe all other wal
Method o	f Assessm	ent	Theory Exam			Exte	ernal

RGPV (E WING)	DIPLOMA BHOPAL	O	BE CUF	RRICULUM FOR THE COURSE	FORM	1AT - 3	Sheet No. 3/4
Branch	REFRIGE	RATION	AND AIF	CONDITIONING ENGINEERING	S	emester	VI
Cours	se Code	601	Course Name	HVAC LOAD ESTIMATIO	N		
Course	Outcome 4	Estimate	e Heat Loa	d Gain through Internal Heat Source		Teachin Hrs	g Marks
Learning	g Outcome 8	Explain	procedure	for estimating occupancy load		7hrs	10
Co	ntents	Heat load heat gain temperat cooling l occupant	d gain from n from occ ure. Rate o oad factor	n occupants, Sensible and Latent heat g cupants at different activity level base of heat gain from occupant at conditione (CLF) for people, Total heat gain, sens	gain fro ed on ed spac sible he	om occupa 24°C roo ce (W), S eat gain fr	unts, rate of m dry bulb ensible heat action from
Method o	f Assessment	Theory	Exam			Exterr	nal
Learning	g Outcome 9	Estimate equipme	e the Heat ent	load gain from lightening, appliance	s and	7hrs	10
Co	ntents	Show Th gain three equipment copiers c Heat gai Book	e value of ough light nts Genera consume er in rate for	wattage of light is given according to the s, Heat gain from electric equipment l office equipments such as computers, hergy even when these are not in use, hergy even when these are not in use, hergy equipments (Watts) 2001 ASI	he type hts, He , printe heat ga HRAE	e of use in eat gain ers, fax m in from p Fundame	room, Heat from office achines and roduct, Use entals Hand
Method o	f Assessment	Theory	Exam			Exter	nal
Learning	Outcome10	Estimate	e Heat gain	from system heat load		3hrs	5
Co	ntents	Product loss, retu heat gain	load, proce irn air duc from dehu	ess load, system heat gain, supply air t heat gain and leakage loss, heat gain imidifier pump and piping	duct h 1 from	eat gain a air condi	and leakage tioning fan,
Method o	f Assessment	Progre	ssive Test	- II		Inte	rnal
Learning	Outcome 11	Calcula	ite heat gai	n due to Ventilation, Infiltration		3hrs	5
Co	ntents	Infiltration infiltration unit Area Quality F	on, Stack on due to d a, Number Regulation	effect, Wind action, crack method oor opening, value of Required Ventila of air changes per hour, Ventilation and Standards	and tion ra for A	air chan te per Per cceptable	ge method, son and per Indoor Air

Method	of Assess	ment	Progressive Test - I	[Int	ernal
RGPV (WING	(DIPLC) BHO)MA PAL	OBE CURR	ICULUM FOR THE	FORM	IAT - 3	Sheet No. 4/4
Branch	REFR	IGERA	TION AND AIR COM	NDITIONING ENGINEERING	Ser	nester	VI
Course	Code	601	Course Name	HVAC LOAD ESTIMATI	ON	·	
Course O	outcome !	5 Esti	mate total capacity of j	plant		Teaching Hrs	Mark s
Learning	Learning Outcome 12		ulations of Grand Tota	l Heat (GTH), Total Refrigeration		6hrs	6
Con	tents	The supp supp bulb Gran ASH CFM	assumptions behind d ly air, Supply air temp ly air for actual coil, (temperature (supply)) d Total Heat (GTH) RAE /ANSI Standard I per person for variou	lesign cooling load, equation of perature (Ts), method of calculat Quantity of Air Using fresh air fo , Quantity of Recalculated Air, , Total tonnage, Analysis of ca s for various occupancy zones, Siz s applications	Dehun e Dehun or ventil Enterin ilculated ze of air	nidified ai midified a ation, Le g Air DB d ventilati condition	r quantity of ir quantity of aving air dry T (Mixing)-, ion rates v/s her, sqft/TR,
Method of	Assessme	ent The	eory Exam			External	
Learning	Learning Outcome 13		Optimize of Thermal lo	oad of plant		4hrs	4
Cor	ntents	Mini therr use main	mization of solar gain nal properties of const of natural ventilation tenance, use of automatic	, shading of the building air locks truction material, minimization in for cooling, use of thermal s atic controls, Artificial Intelligence	, build filtratio torage, e (AI)/ l	ing design n and ver plant sel nternet of	features and tilation load, ection ,plant things)IOT
Method of	f Assessm	ent Terr	n Work		In	ternal	

		ma Mina) Dhonal					Bra	anch (Code		Co	ourse Co	de	CO Code	LO Code	_	Л
KGP		na wing	ј впораг		R LEARNING C			R	0		1	6	0	1	1	1	Format N	o. 4
COUR	SE NAME	HVAC	LOAD EST	IMATION														
CO De	scription	CO-1 Sit	e selection for	a given air condit	ioning system													
LO Des	scription	LO-1 Ide	ntify suitable i	nside and outside	design condition	ns for comfort	air	con	ditio	oning	g							
					SCHEME	OF STUDY												
S. No.		Lear	rning Content	:	Teaching – Learning Method	Descrip Pre	otio oce	on of ess	FT-L		т	each	Hrs.	Prac /Tu Hrs	ct. it 5.	LRs R	equired	Rem arks
1	Classific India, ou months, outside of ASHRAI condition Correction of day as condition	ation of Cl itside design weather d lesign cond E recom ns, table ons to outdo nd Time of ns	imate Zone, C n data at differ ata, Selection itions for wint mended su for major por design Con year, Inside i	Climate zones of rent latitude and of inside and ter and summer, mmer design Indian cities. aditions for time ndustrial design	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will contents ASHRAE th Standards students. conduct Quiz students p knowledge	ill and her 55. Tea z/v prae	expl d mal .hanc ache isit ctice	lain pro con dout r to r	the ovide nfor to wil nake thei	e t D 1 e r	4	-	0		ASHRA handboo Handou Videos, data fo cities	E ok, Carrier ok ts, Charts, Climate or given	NIL
					SCHEME OF	ASSESSMEN	Т											
S. No.	Meth Assess	od of sment		Des	cription of Asse	essment							Max Ma	imum arks	R	esource Require	es Exter d Inte	rnal / ernal
1	Progressiv	ve Test I	Student will 1. Select sui given situ	be asked to (and/o table Inside/Outsi ation (Identify the	or) ide design condit e Climate Zone/C	ions for comfo Criteria/Correc	ort	air c ns)	cond	itior	ning	in		5	P	en pape	r Intern	al
			1	ADDITIONAL IN	ISTRUCTIONS F	OR THE HOD)/ F	ACL	JLTY	((IF	AN	Y)						

RG	PV (Diplo	ma Wing	g) Bhopal	SCHEME F	OR LEARNIN	IG OUTCOME		Branch C	ode		Course C	Code	CO Co de	LO Code	Format N	4
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COU	RSE NAME	HVAC	LOAD ESTI	MATION											- <u>'</u>	
CO D	escription	CO-1 Sit	e selection for a	a given air cond	ditioning system	n										
LO D	escription	LO-2 Exp	plain managem	ent of Indoor A	ir Quality											
					SCHE	ME OF STUDY										
S. No.		Learn	ing Content		Teaching – Learning Method	Description	of T	-L Pro	cess	Т	each Hrs.	Pract /Tut Hrs.	•	LRs R	equired	Rema rks
1	Meaning a Source of Syndromes Renovation Affecting A Building V controls of	nd need of Indore A , Buildin Activity, Attributes O /entilation, IAQ	Indoor Air Q ir Pollutant, S g System Air Clean f Indore Air, A Air Change,	Puality (IAQ). Sick Building Maintenance, ing, Factors Improve IAQ, Air Velocity,	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will example and provide comfort Standa students. Teach Quiz/visit to ma their knowledge	xplain ASHI rds : her ike stu	the RAE 55.han will udents	conter therm dout condu practi	nts nal to ict ce	7	0	A h H H V	SHRA andbo landbo landou landou	AE ok, Carrier ok ts, Charts,	
					SCHEME	OF ASSESSMEN	Т					-				
S. No	. Met Asse	hod of ssment		Des	cription of As	sessment				Max M	kimun arks	n Re Re	sou equi	rces red	Extern Interi	al / nal
1	Theory		Students will 1. Explain In 2. Explain So 3. Explain So 4. Explain Bo 5. Describe F 6. Explain gi	be asked (and/o adoor Air Quali ource Of Indoo ick Building Sy uilding System Factors Affectin ven controls of	or) ty (IAQ) and N or Air Pollutant yndromes Maintenance ng Attributes O f Indoor Air Qu	Need of IAQ f Indore Air ality (IAQ)					10	Pa	aper]	Pen	Exter	nal
			·	ADDITIONAL	INSTRUCTION	IS FOR THE HOD	/ FAC	CULTY	(IF AN	NY)					·	

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COURS	SE NAME	HVAC LO	DAD ESTIMATION	I										
CO Des	cription	CO-1 Site se	election for a given air c	onditioning system wit	th special ref	eren	ce to m	najor 1	ndian	cities.				
LO Des	cription	LO 3 Deterr given materia	nine the overall Heat tra als	nsfer coefficient U for	given for w	alls,	roofs,	partit	ions, (Ceiling	gs, Flo	ors, Do	oors, and	Windows for
				SCHEME O	F STUDY							-		
S. No.		Learning C	Content	Teaching –Learning Method	Descrip Pr	otior roce	n of T- ss	L	Teac Hrs	h	Pract. /Tut Hrs.	LRs F	Required	Remarks
1 P L P S n la C C L g	Planning of Location, O Physical d Structures, S naterials, C oad, The Coefficients Ceilings, Fle Load Comp gains sensibl	work, Basic rientation of b limensions of pecification of limate condition rmal conduct U for Wal poors, Doors, a ponent, Extern le heat, latent b	Information, Building building, Use of space of space, Building f building Construction ons. Define Occupancy ctivity, Transmission lls, Roofs, Partitions, and Windows Cooling hal and Internal heat heat	Interactive Classroom method, Handout, PPTs, Charts and Videos	Teacher w contents ASHRAE. students. conduct (make stud their knowl	ill e and Ha Tea Quiz/ dents ledge	explain pro andout cher /visit s pra	the ovide to will to ctice	4		0	ASHI handl Carrie Hand Hand Chart Video	RAE pook, er book outs, s, os	NIL
				SCHEME OF A	SSESSMEN	Т								
S. No.	Met Asse	thod of essment		Description of Asse	essment					Maxiı Ma	num rks	Res Res	ources quired	External / Internal
1	Assessment Assessment Progressive Test I Students will be asked (and/or) 1. Enlist Steps followed for building survey Nake chart to Show the Space Characteristics And Heat Load Sou 3. List the thermal conductivity of given construction materials Enlist guidelines for selection for location of equipment and service 5. Determine the U coefficient for walls, roofs, partitions, Ceilings, H Doors, and Windows for given materials ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY									5		Pen	Paper	Internal

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COU	RSE NAME	HVAC LOAD ESTIN	MATION			·							
CO D	escription	CO 2: Estimation of the	solar heat gain through	glass									
LO D	escription	LO-4 : Describe fenestra	tion, needs , effect on a	ir conditioning									
				SCHEME OF STUDY									
S. No.		Learning Conter	nt	Teaching –Learning Method	Desc	riptio Proce	ר of T ss	L	Teach Hrs.	Prac /Tut H	t. Irs.	LRs Required	Rema rk
1	Distribution through fen effect of til glass open haziness. S Adjacent B Cooling L Cooling Loa	of Solar radiation, solar t estration, solar heat gain the t of glass on solar gain, e ing, effect of shading d bhading from Reveals, o uildings, Space heat gain a oad Temperature Diffe ad(SCL)/ Cooling Load Fac	ime, Solar radiation brough ordinary glass, ffect of orientation of evice, effect of sky Dverhangs, Fins and nd space cooling load, brence(CLTD)/ Solar ctor(CLF) method,	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teache the provide Teache Quiz/v studen knowle	er will conten e A er will isit ts prac edge	expl ts a ASHR cond to ma tice th	ain and AE uct ake neir	8	0	H C H H C V	ASHRAE andbook, Carrier Handbook Handouts, Charts, Videos	
			SCH	IEME OF ASSESSMENT							I		
S. No.	Method o Assessme	nf nt	Description	of Assessment				N	laximu Marks	im F	lesou Requi	rces Externed Int	ernal / ernal
1	Theory Exa	ImStudents will be asked1.Explain Need2.Describe Radia3.Explain effect4.Describe CLT	d (and/or) for fenestration in build ation properties of clear of external shading / tilt D/SCL/CLF method for	ings glass of glass/ sky haziness /so space heat gain and space	lar time e cooling	on sola ; load	r gain		10		Fest P	aper Exte	rnal
	·		ADDITIONAL INSTRUC	TIONS FOR THE HOD/ F	ACULT	Y (IF A	NY)						

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COU	RSE NAME	HVAC LOAD ESTI	MATION											
CO D	escription	CO-2 Estimation of the	solar heat gain through glass											
LO D	escription	LO5- Calculate heat tran	sfer rate due to fenestration											
			SCH	EME OF STUDY										
S. No		Learning Cont	tent	Teaching – Learning Metho	d	Desc	riptio Proce	n of T- ess	·L	Teach Hrs.	Pra /Tut	ct. Hrs.	LRs Required	Rema rk
1	Calculation o penetration o (SHGF) and (SHGF) for v types of shad solar heat ga Cooling load device using	f Transmission heat gain f solar radiation - maxim Cooling Load Factor (CL vindows glass with indoo ing device and their coeff in through glass with an factor (CLF) for window ASHRAE Fundamentals.	through glass, and by direct um Solar Heat Gain Factor LF). Solar Heat Gain Factor r shading devices. Different ficients, Over all factors for d without shading devices, rs glass with indoor shading	Interactive Classroom metho Handout, PPT Charts and Videos.	od, Γs, ·	Teache provid Teache Quiz/v studen knowl	er will conter e 2 er will visit ts prace edge	l expla nts a ASHRA l condu to ma ctice th	ain Ind AE Iuct Ike eir	7	0		ASHRAE handbook, Carrier Handbook Handouts, Charts, Videos	
'			SCHEMI	OF ASSESSMENT	•						1			
S. No.	Method of Assessmen	t	Description of As	ssessment					N	laximu Marks	im F	Resou Requ	rces Ex ired / Ir	ternal Iternal
1	Theory Exam	 Students will be asked 1. Explain Solar Heat Coefficient (SC). 2. Calculate heat trans tables and shading of 	(and/or) Gain Factor (SHGF), Cooling fer rate due to fenestration us coefficients	g Load Factor (CLF) ing Cooling load fac) and	l Shadi (CLF),	ng SHGI	F		10]	Sest Pa	aper Ext	ernal
			ADDITIONAL INSTRUCTIO	NS FOR THE HOD/	FAC	CULTY	(IF AN	IY)						

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COU	RSE NAME	HVAC LOAD ESTIM	ATION												
CO D	escription	CO-3 - Estimate heat transf	er rate for opaque	surface using CLTD/ETI) met	thod									
LO De	escription	LO- 6- Explain the general	aspects of heat tran	nsfer through buildings											
				SCHEME OF STUDY											
S. No.		Learning Content		Teaching –Learning Method	I	Descr F	iptio Proce	n of ss	T-L		Teach Hrs.	Prac /Tu Hrs	:t. t .	LRs Required	Remar k
1	One-dimensit through bui Non-homoge Thermo-phy and insulatin air film, T temperature	onal, steady and unsteady s dings, walls and roof Ho eneous walls, Overall heat tra- sical properties of some c g materials, Surface or film hermal conductance of a	state heat transfer mogeneous wall, ansfer coefficient, common building n conductance for ir space, Sol-air	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teac conte ASH stude cond stude know	cher weents IRAE. ents. duct Q ents wledge	will o and H Tea uiz/vi prac	ando cher sit t	ain th provid out t wil to mak thei	e o ll e ir	7	0	A h C H H C V	ASHRAE andbook, Carrier Iandbook Iandouts, Charts, Videos	
			S	CHEME OF ASSESSME	NT										
S .	Method o	f	Descriptio	n of Assessment						Ma	ximum	n Re	sour	es Ext	ernal /
No.	Assessme		1/ >							N	larks	Re	equir	ed Int	ternal
1	No. Assessment Description of Assessment Term Work Term Work Students will be asked (and/or) (TW) 1. Explain One-dimensional, steady and unsteady state heat transfer through buildings 2. Explain Overall heat transfer coefficient for given material 3. Enlist the Thermo-physical properties of some common building and insulating mater 4. Explain Surface or film conductance for air film, Thermal conductance of air space, Sair temperature						ials Sol-		5		n Pap		nai		
		AC	DDITIONAL INSTR	UCTIONS FOR THE HO	D/ FA	ACULT	ΓY (IF	AN	Y)						

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τοι	JRSE NAME	HVAC LOAD ESTIM	ATION			·							
COI	Description	CO3- Estimate heat transfer	rate for opaque surface	using CLTD/ETD me	ethod	b							
LO	Description	LO 7 - Calculate Sensible He	eat Gain through Opaque S	Surface									
			SCH	EME OF STUDY									
S. No		Learning Conten	t	Teaching –Learnin Method	ng	Descr F	iptio Proce	n of T-L ess	Teach Hrs.	Prac /Tu Hrs	xt. t s. F	LRs Required	Rema rk
1	Calculation of Temperature I CLTDs for D factor with wa rate with time values for all Fundamentals	F Overall heat transfer co Difference (CLTD) for wal type of walls, Variation of all thickness and density, V for thick and thin walls of other wall groups referred Handbook)	efficient, Cooling Load ls and roofs. Equivalent time lag and decrement variation of heat transfer of building. (The CLTD l in the 1997 ASHRAE	Interactive Classroo method, Handou PPTs, Charts an Videos.	om Tut, t at, t nd H G S t	Teache the c provide Teache Quiz/vi student their kr	r will onter e A r will isit s nowle	l explai nts an SHRAE l conduc to mak practic edge	n 8 I	0	A h C H H C V	ASHRAE andbook, Carrier Iandbook Iandouts, Charts, Videos	
			SCHEMI	E OF ASSESSMENT	I						I		
S. No.	Method of Assessmen	t	Description of Ass	essment				Ma	ximum 1arks	Re Re	sourc equire	es Extended	ernal / ernal
1	Theory Exam	 Students will be asked (a 1. Explain Cooling load to walls for difference factors affect density. 3. Determine the Overall 	nd/or) temperature difference (CI cing ting Variation of time lag heat transfer coefficient fo	LTD)/Equivalent CLT /decrement factor wit or given Opaque Surfa	TDs f h wa aces.	for D ty all thick	/pe of mess/	f /	10	Test	Paper	Exte	rnal
		AC	DITIONAL INSTRUCTIO	NS FOR THE HOD/ F	ACU	JLTY (I	F AN	Y)					

RGI	PV (Diploma	a Wing) Bhopal	SCHEME FOR LEARN	ING OUTCOME	E	Branch Coo	de	C	ourse Co	ode	CO Code	LO Co	ode		Л
					R	0	1	6	0	1	4	8	Fo	rmat N	lo. 4
COU	RSE NAME	HVAC LOAD E	STIMATION					•					•		
CO D	escription	CO-4 Estimate Heat	Load Gain through Intern	al Heat Source											
LO D	escription	LO-8 Explain procee	dure for estimating occupa	ncy load											
				SCHEME OF STU	DY						-	-			
S.		Learning Cor	ntent	Teaching –		Descr	iptio	n of 1	Γ-L	Teach	Prac	ct.	LRs Req	uired	Remark
No.				Learning Metho	d	F	Proce	ess		Hrs.	/1001	Hrs.			
1	Heat load ga	ain from occupants, S	Sensible and Latent heat	Interactive		Teache	er wil	l expl	lain	7	0		ASHRAI	Ξ	
	gain from o	ccupants, rate of hea	at gain from occupants at	Classroom metho	d, 1	the c	conte	nts	and				handbool	κ,	
	different ac	tivity level based o	on 24°C room dry bulb	Handout, PPT	's, 1	provide	e A	SHR	AE.				Carrier	1	
	temperature	conditioned space (W), Sensible heat cooling load factor Teacher w											Handboo	K	
	(CLF) for people, Total heat gain, sensible heat gain Quiz/visi												Charts V	s, Videos	
	(CLF) for people, Total heat gain, sensible heat gain fraction from occupants students												Charts, v	lucos	
	fraction from occupants students their knowled														
			S	CHEME OF ASSESS	ME	NT			•						
S.	Method o	of	Description	of Assessment						Maxir	num	Re	sources	Exte	ernal /
No.	Assessme	nt								Mai	'ks	Re	quired	Inte	ernal
1	Theory Exa	m Students will b	e asked (and/or)							10)	Tes	st paper	Exter	nal
		1. Explain Hea	at load gain from occupant	s with equations.											
		2. Enlist the ra	te of heat gain from occup	ants at given activit	ies le	evel ba	sed o	n 24°	С						
		room dry bu	ilb temperature.		1	4 1:66									
		5. Explain sens	sible neal Cooling Load Fa	ictor (CLF) for peop	ne ai	t anner	ent ti	me							
		4. Explain Tot	al heat gain. Sensible heat	gain fraction from c	occui	pants.									
		···		UCTIONS FOR THE	HO	D/ FA	CULT	Y (IF	ANY)			1		1	
								•	,						

		we Wine \ Dhenel			В	Branch Co	de	C	ourse Co	de	CO Co	ode LO C	ode	_		Л
		па wing ј впораг		ARINING OUTCOME	R	0	1	6	0	1	4	9)	Form	at No. (4
COU	RSE NAME	HVAC LOAD EST	IMATION													
CO D	escription	CO-4 Estimate Heat Lo														
LO D	escription	LO 9 Estimate the Hea	t load gain from ligh	ntening, appliances and	equ	ıipmen	nt									
SCHEME OF STUDY																
S. No.		Learning Conten	t	Teaching –Learning Method	g Description of T-L Process				of T-L Teac s Hrs.		ach rs.	Pract. /Tut Hrs.	ct. Hrs. LRs Red		uired	Remark
1	Show The v to the type Heat gain to office equip computers, energy ever product, Us (Watts) 200	value of wattage of light of use in room, Heat g from electric equipment oments General office ex- printers, fax machines and when these are not in use Heat gain rate for 1 ASHRAE Fundamenta	Interactive Classroom method, Handout, PPTs, Charts and Videos.	T CO A St CO M th	Teacher will explain the contents and provide ASHRAE. Handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge					7	0		2001 ASHRAE fundamentals handbook, Carrier Handbook Handouts, Charts, Videos			
				SCHEME OF ASSESS	MEI	NT										
S. No.	Method o Assessmer	f it	Description	n of Assessment						Maxi Ma	laximum Re Marks Re		Resource Requirec		Exte Inte	rnal / ernal
1	Theory	Students will be aske 1. Estimate Heat gai 2. Estimate Heat gai 3. Estimate Heat gai 4. Estimate Heat gai	d (and/or) n through given ligh n from given electri n from given office n from given produc	nting equipments c equipments equipments ct						1	0	Test	Pap	er	Extern	al
			ADDITIONAL INS	TRUCTIONS FOR THE	HO	D/ FA	CULT	Y (IF	ANY							

RG	PV (Diploma Wing)	Bhopal SCHE	VIE FOR LEARNIN	IG OUTCOME	Br	anch Coo	le	Course	Code	CO LO Code Cod		Forma	at No.
			R 0 1					6 0	1	4	10	4	Ļ
	COURSE NAME												
CO D	escription												
LO D	escription												
			SCHE	ME OF STUDY									
S.	Learning	Content	T-L Method	Description o	f T-L F	Proce	SS	Teach Hrs.	Pra	ICT. LRs Req		quired	Rema rk
1 	Product load, process supply air duct heat g return air duct heat g heat gain from air cond from dehumidifier put	load, system heat gain, gain and leakage loss, gain and leakage loss, ditioning fan, heat gain mp and piping	Interactive Classroom method, Handout PPTs, Charts and Videos, Models	Teacher will explai provide ASHRAE Standards 55.hand Teacher will condu- make students knowledge	3	()	ASHRA handboo Carrier Handbo Handou Charts, Videos					
			SCHEME	OF ASSESSIVIEN I				T					
S.	Method of Assessm	ent	Description of Assessment					Maximum		Re	Resources		rnal /
No.									/larks	R	equired	Inte	ernal
1	Progressive Test 2	Students will be 1. Describe 2. Explain S heat gain 3. Estimate dehumidi	scribe Product load/ Process load splain System heat gain/ Supply air duct heat gain / Return air duct at gain / Leakage loss stimate Heat gain from air conditioning fan / Heat gain from shumidifier pump and piping						5	Pe	n Paper	Intern	nal
		IS FOR THE HOD/ F	ACUL	TY (IF	ANY)								

DCI	RGPV (Diploma Wing) Bhop						Branch	Code	c	ourse (se Code CO Code		LO Code		Л
KGF	v (Dipioma wing) Bi	nopai	SCHEIVIE FU	IR LEARNING	OUTCOIVIE	R	2 0	1	6	0	1	4	11	Format N	lo. 4
	COURSE NAME		HVAC LOAD	ESTIMATION										1	
CO D	escription		CO-4 Estimate Hea	at Load Gain throu	gh Internal Heat So	our	ce								
LO De	escription		LO- 11 Calculate h	eat gain due to Ve	ntilation, Infiltratio	on									
	1			SCHEME OF	STUDY										
S. No.	Learning	g Conten	t	Teaching – Learning Method	Description of	T -I	T-L Process			Teach Hrs.		Pract. /Tut Hrs.	LRs	Required	Rem ark
1	Infiltration, Stack effect, Wind action, crack method and air change method, infiltration due to door opening, value of Required Ventilation rate per Person and per unit Area, Number of air changes per hour, Ventilation for Acceptable Indoor Air Quality Regulation and Standards Handout, PPTs, Students. Teacher will Quiz/visit to make practice their knowledge					plain p dout vill co ce str edge	th rovid t onduc udent	the 3 ide to uct ents			0	ANS ASH hand Carri Hand Hand Char	I, RAE book, er book outs, cs, Videos		
				SCHEME OF ASS	SESSMENT										
S. No.	Method of Assessment		Descript	tion of Assessme	nt		ſ	Maxi Ma	mur rks	n	R F	esourc Require	es ed	Extern Interr	al / 1al
1	Progressive Test 2	Students 1. Explai 2. Descri 3. Calcul 4. Enlist	will be asked (and/on Infiltration, Stack be Crack method and ate Number of air ch Ventilation standard	or) effect, Wind action d air change metho nanges per hour for s for Acceptable In	n. od r given conditions ndoor Air Quality			2	i		Pen I	Paper		Internal	
			ADDITIONAL INST	TRUCTIONS FOR	THE HOD/ FACUL	LTY	(IF /	ANY)							

		han Ming \ Bhanal			Brancl	n Code	Cou	rse Code	CO Code	LO Code		Л
		oma wing j Bhopai	SCHEWIE FOR LEARNING C		R	0 1	6	0 1	5	12	Format No	o. 4
COU	RSE NAME	HVAC LOAD ESTIM	ATION		I	I				I		
CO D	escription	CO- 5 Estimate total capacit	ty of plant									
LO D	escription	LO- 12 Calculations of Gra	and Total Heat (GTH), Total Refr	rigeration Tonn	age							
			SCHEME O	F STUDY								
S. No.		Learning Con	Desc	ription Proces	of T-L s	Teach Hrs.	Pract. / Tut Hrs.	LRs	Required	Rem ark		
1	The assump air quantity calculate D Quantity of temperature (Mixing)-, calculated v occupancy z various appl	tions behind design cooling l of supply air, Supply air ehumidified air quantity of Air Using fresh air for ver (supply), Quantity of Recal Grand Total Heat (GTH), entilation rates v/s ASHRA ones, Size of air conditioner ications	explain s and HRAE. tudents. conduct o make practice ge	6	0	ASH hand Carr Hand Psyc Char Hand Char Vide	IRAE book, ier lbook, hometric ts/Tables louts, ts, os					
			SCHEME OF A	SSESSMENT								
S. No.	Method o Assessmen	f	Description of Assessn	nent				Maxiı Ma	num F rks	Resour Requir	ces Exte ed / Int	ernal ernal
1TheoryStudents will be asked (and/or) 1. Calculate Dehumidified air quantity/ temperature (Ts) of Supply air with/ without bypass 2. Calculate Quantity of Air Using fresh air for ventilation 3. Calculate Dry bulb temperature of Leaving air (re circulating air) 4. Calculate Quantity/Temperature of Air before mixing/ after mixing 5. Calculate Grand Total heat (GTH), Total tonnage 6. Calculate Size of air conditioner, sqft/TR, CFM per person for given applications10Test PaperExternal												rnal
			ADDITIONAL INSTRUCTIONS FO	R THE HOD/ FAC	CULTY (I	F ANY)						

RGPV (Diploma Wing) Bhopal		SCHEME			Br	anch Co	de	Cours	e Code	CO Code	LO Code		. Л		
F	COURSE NAME HVAC LOAD ESTIN			SCHEIVIE	FOR LEARINING OUT	COIVIE	R	0	1	6	0 1	5	13	Format No. 🖛	
COUR	SE NAME	HVAC	C LOAD ESTIM	ATION											
CO De	escription	CO-5 1	Estimate total capacit	y of plant											
LO De	scription	LO-13	To Optimize of The	mal load of pla	nt										
					SCHEME OF STUE	Y									
S. No.		Le	arning Content		Teaching –Learning Method	Descrij P	ption rocess	of T-I S	-	Teach Hrs.	ich Prac s. /Tut I		LRs Required		Remar k
1	Minimization locks, built of construct ventilation use of the maintenance Intelligence	on of sola ding desi tion mate load, use hermal e, use e (AI)/ Int	ar gain, shading of the ign features and there erial, minimization i of natural ventilation storage, plant sel- of automatic contra- cernet of things)IOT	Interactive Classroom method, Handout, PPTs, Charts and Videos, Models	Teacher the co provide Handout Teacher Quiz/visit students knowledg	will ontents AS to s will t to praction ge	expla SHRA studer condu o ma ce th	ain Ind IE. Its. Ict Ike eir	4	0		ASHRAE handbook, Carrier Handbook Handouts, Charts, Vide			
					SCHEME OF ASSESS	MENT									
S. No	Meth Assess	od of sment		Descr	ption of Assessment					Max Ma	imum arks	Re Re	sources equired	s Exte Inte	rnal / ernal
1	TERM V	VORK	 Student will be ask 1. Describe Optim 2. Explain minimit 3. Explain buildin 4. Enlist Steps of 5. Explain the use 6. Describe autom 	ed to (and/or) nization of build zing solar gain, g design feature minimization ir of thermal stor natic controls, A	ling load / shading of the building/ es / thermal properties of filtration and ventilation age/ Natural ventilation. artificial Intelligence (AI	/ air locks f construction load)/ Internet of	on mat	terial gs)IC	ЭT		5	Te	st Paper	· Inte	ernal
	'		AD	DITIONAL INS	TRUCTIONS FOR THE	HOD/ FAC	ULTY	(IF AI	NY)	-		-		1	

PCD		na Win	yg) Bhonal			1	Branch C	ode		Co	urse Coo	le	CO Code	LO Code	_	/
				SCHEWL FOR L	R 0 1 6			0	1	5	14	Forn	nat No. 🕂			
COURS	E NAME	HVA	C LOAD EST	TIMATION												
CO Des	cription	CO3 E	stimation heat tr	ansfer rate for opaque	e surface using CLTD/ETD) meth	od									
LO Des	cription	LO- 14	Describe Cooli	ing load estimation for	Cold storages											
					SCHEME OF STUDY											
S. No.			Learning Conto	ent	Teaching –Learning Method	De	script Pro	ion oces	of ⁻ s	T-L	Tea Hr:	ch s.	Pract. /Tut Hrs	5. R	LRs equire	Remar
1	insulating of refrige Design in infiltratio for therm	g materia eration nput dat n, daily al envelo	al selection, Coo load, Product s a, respiration lo loading, interna ope	Interactive Classroom method, Handout PPTs, Charts and Videos.	Teach the provid Hand Teach Quiz/ studes know	Teacher will explain the contents and provide ASHRAE. Handout to students. Teacher will conduct Quiz/visit to make students practice their						0	AS ha: Ca Ha Ha Ch Vi	k,		
					SCHEME OF ASSESSMEN	IT										
S. No.	Metho Assessr	d of nent		Descrip	otion of Assessment						M	axim Marl	num ks	Resou Requ	urces ired	External / Internal
1	Term Wo	Term WorkStudent will be asked to• Criteria of site selection of cold storage, insulating material selection• Cooling load calculation for cold storages• Variety of Product storage, temperatures, requirement of design input data• Respiration load, pull down time, infiltration, daily loading, internal loads										5		Pen P	aper	Internal

		• U – factors for thermal envelope										
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												