	V (DIP											LU			FO	RM 3	AT-		eet	
Branch	REFR	RIGER	ATIO	ON A	AND	AII	R CO	ON	DIT	(OI	NIN	IG E	NGI	NEI	ERI	VG	Sem	estei	r V	I
Course Code		Cou Nai			ISTA VAC				•		ING	G AN	D CO	ОМ	MIS	SIO	NING	G OF	י	
Course	Outco	me 1	Appli of RA				asic	to to	ols,	pro	ced	ures	for r	nai	nten	ance	Tea Hrs		Mark	īs
Learning	Outcor	me 1	Descr syster			ols,	oper	ratio	ons	for	со	pper	tubi	ng	of :	RAC	5	5	10)
Contents			condi	ditio igera	ning ation	pracand	tices air c	s. C	Class ditio	sific oning	atio g sy	n and stem	d type s. Pro	es o	f joi lure	nts, c of Tu	onne	ction	and as used g, flari	l in
Method o Assessme			Theo	ory I	Exan	n										Exte	rnal			
Learning	Outcor	me 2	Expla RAC			-	edui	re o	of u	ısinş	g co	opper	tubi	ng	tool	s for	5		10	
Contents			Const condi	struc dition igera	ctiona oning ation	al d prac and	tices air c	s. C	Class ditio	sific oning	atio g sy	n and stem	d type s. Pro	es o	f joi lure	nts, c of Tu	onne	ction	and as used g, flari	l in
Method o Assessme			LW									_]	Exte	rnal				
Learning	Outcor	me 3	Descr syster		e pro	oced	ure	for	r re	efrig	gerai	nt c	hargii	ng	in :	RAC	6		10	
Contents			soluti	tion,	, Ha	lide	torc	ch,	Ele	ctro	nic	dete	ctor,	Ty	pica	l me	thods	. Re	by so efriger Pressu	ant
Method o Assessme			Theor	ory I	Exan	1										Exte	rnal			
Learning	Outcor	me 4	Expla	lain '	work	king	with	Sh	eet 1	met	al fo	or ma	king	duc	ts		4		5	
Contents			_	ding,	, rive	eting	ano			-									l cutti protect	_
Method o Assessme			PG I	I			_					_	_		Inte	rnal		_		
Learning	Outcor	me 5	Descr		e tub	e joi	ning	for	r ref	rige	eratio	on an	nd air	con	ditio	oning	3		5	
Contents				cond	dition	ning	pla											_	ation a Safety	
35.13.3	•																			

Internal

Method of

Assessment

PG I

RGPV (I WING)			OI	E CURRICU THE CO		FORMA	т-3	Shee No.	
Branch	REFRI	GER	ATIO	AND AIR CONDI	TIONING ENGINI	EERING	Semes	ter	VI
Course Code			urse ame	INSTALLATION, HVAC&R SYSTE	TESTING AND CO	OMMISSI	ONING	OF	
Learning (Outcome	, U	Analyz plants	e Basic Electrical ar	nd Electronics circuit	ts of RAC	10	10	
Contents			and ear termina differer motors	th resistance. Single ls of sealed compres t types of motors. Identification of t	vire joints. Measuren phase connection of ssor and their windir Testing and connect he electronic components of the property o	motors. Idngs, use of ion of relationents. Te	lentifica DOL s sys used sting of	tion of tarter in s resi	of the with ealed stors,
Method of Assessmen			LW			Internal			
Course C	Outcom	e 2	Comm	ssioning of given RA	AC Plants		Teach Hrs	Ma	arks
Learning (Outcome	7	Plan R	AC projects			8	10	ļ
Contents			approa CPM & system	n. Organetwork 's locat apacity Procedu	c ana ions i contr	llysis: in the rol of			
Method of Assessmen			PG II			Internal			
Learning (Outcome	8	Testing	of given RAC plant	S		10	10	
Contents			for – Genera System	Pressure, Temperatu And Specific Testi	red To HVAC&R Prore, Flow, Air Qualing And Its Procedure Systems, Return And Fan Performance	ity, Power es For Cor	, Harm nstant A	onics ir Vo	Etc.
Method of Assessmen			LW External						
Learning (Outcome	9	Execute RAC plant Commissioning 6 10						
Contents			Introduction to Commissioning, Objectives of Commissioning, Benefits of Commissioning. Cost Benefit Analysis. Levels of commissioning. Selection Of Commissioning Provider, The HVAC Commissioning Team, Comprehensive HVAC Commissioning. Construction HVAC Commissioning. HVAC Commissioning In Existing Buildings						
Method of assessmen			Theory	Exam	-	Exter	nal		

	GPV PLOMA BHOP		O	BE CURRICULUM FOR THE COURSE	FORMA'	г-3	Shee No.	
Branch	REFR	IGEF	RATI	ON AND AIR CONDITIONING ENGIN	EERING	Seme	ster	VI
Course Code		Cou Na		INSTALLATION, TESTING AND CO. HVAC&R SYSTEMS	MMISSION	NING (OF	
Course	Outcon	ne 3	Desc	cribe Project Management of HVAC&R		Teach Hrs	Ma	arks
Learning 10	Outcom	1e	Expl	ain HVAC&R Project reports		8	10	
Contents	}		Skill on C	ective of project report, need of Technical of s, Report preparation skills, Professional CAD Drawings. Preparation of project denming, air stratification, comparison of variance, Bill of Quantities, Payable period	Ethics. Read nand, project arious syste	ding an t detail	d Wo s, div	orking versity
Method of Assessme			The	ory Exam	Exter	nal		
Learning 11	Outcon	1e	Prep	are Tender Estimation document for given	project	8	10	
Contents	1		strat	aration of project demand, project det ification, comparison of various systems for uantities, Payback period of system		•		_
Method o			LW		External			
Learning 12	Outcon	ne	Pres	ent project plan, tender document for given	project	10	10	
Contents	1		- C	entation skills, seminar : preparation of PP ase Studies Of Critical Projects, High umissioning Tasks				
Method o			TW	I	nternal			
Course	Outcon	ne 4	Desc	cribe RAC Plant Operations		Teach Hrs	n Ma	arks
Learning 13	Outcon	ne	Desc	cribe manual operation of RAC plants		8	10	
Contents	1		gaug	trol panels, Different parameters to obs ges and their interpretations, log book ually operated plants				_
Method of Assessme			LW	I	nternal			

	GPV PLOMA BHOP	\	OBE CURRICULUM FOR THE COURSE	FORMA	т-3	Shee No. 1	
Branch	REFR	IGERAT	ION AND AIR CONDITIONING ENGIN	EERING	Semes	ter	VI
Course Code		Course Name	INSTALLATION, TESTING AND COM HVAC&R SYSTEMS	MISSION	ING O	F	
Learning 14	Outcon	e Ex	plain IBMS in HVAC systems		7	10	
Contents	ı	arc CC	roduction to IBMS, Functions of IBMS hitecture, interaction with other building start etc.), Introduction To LONWORKS, BAndards. Controlling methods of HVAC Comp	ystems(Ligh Cnet, MOD	nting, F BUS an	ire sa	ıfety,
Method o Assessmo		Th	eory Exam	Exter	nal		
Course	Outcon	ne 5 Ex	plain the procedure to repair for given RA	C systems	Teach Hrs	Ma	rks
Learning 15	g Outcon	Re	plain the procedure to resolve possible frigeration systems		10	10	
Contents		ref	Less cooling then indicated	on with the			
Method o		Th	eory Exam	Exteri	nal		
Learning 16			plain the procedure to resolve possible fau	ilts for Air	10	10	
Contents		ref	ep by step procedure for trouble shooting of erence to Possible defects- diagnosis- solut poting charts: a. System not starting b. System starts but no air cooling c. Less air cooling then indicated d. Frequent tripping/ short cycle e. Frosting in evaporator/ at expansion device. f. System making noise g. System runs continuously without stopping	ion with the			
Method of Assessme		Th	eory Exam	Exter	nal		

RG	DV (Dinlor	ma Wing) Bhopal SCF	HEME EO	R LEARNING OUTCOME		ch Code	Coui	rse Code	CO Code	LO Code	Former No	. 1
	ii v (Dipioi	ila willig / Bilopai	ILIVIL I O	IN LEANINING GOTCOME		0 1	6	0 2	1	1	Format No). T
col	JRSE NAME	INSTALLATION, TESTING	AND CO	MMISSIONING OF RAC	SYSTEMS	3						
COI	Description	CO-1 Application of Basic to	ols, proce	dures for maintenance of l	RAC systen	1S						
LO	Description	LO-1 Describe tools, operation	ns for copp	per tubing of RAC systems								
				SCHEME OF STUDY	•							
S.		Laguring Contact		Teaching -Learning	Descr	iption of	T-L	Tead	h Pra	act. /	LRs	Ren
No.		Learning Content		(T-L) Method		Process		Hrs	. Tu	t Hrs.	Required	ark
1	Construction	al details and use of tools	used in	Interactive Classroom	Teacher	will exp	lain th	ie 5			ASHRAE	NII
	refrigeration	and air conditioning p	practices.	method, Handout, PPTs,	contents	and	provid	e			handbook,	
	Classification	n and types of joints, connection	s used in	Charts and Videos.	ASHRAE.	Hando	outs t	o			Carrier	
		1 ' 1'.' '	Procedure	Laboratory/Workshop	students.	Teache	r wi	11			Handbook	
	refrigeration	and air conditioning systems. F	Toccaute	zacoratory, wormshop								
		and air conditioning systems. Fitting, flaring, swaging, bending,		demonstration	conduct Q	uiz/Visit/	Semina	ır			Handouts,	
	of Tube cut	Ų ,			conduct Q to make	_					Handouts, Charts,	

S.	Method of	Description of Assessment	Maximum	Resources	External /
No.	Assessment		Marks	Required	Internal
1	Theory exam	 Students will be asked (and/or) Explain the procedure for Tube cutting/ Tube flaring/ Tube swaging/ Tube bending/ Tube pinching/ Tube brazing for copper tubing Enlist the tools used in refrigeration and air conditioning practices Enlist the joints/connections used in refrigeration and air conditioning systems 	10	Test Paper	External

D.C	:DV /Diploma W	ing \ Phonol CCUE	NAE EO			ranch Co	de	Co	ourse Co	ode	CO Code	Code		
NU	iPV (Diploma W	ilig / bilopai Sche	IVIE FO	R LEARNING OUTCOME	R	0	1	6	0	2	1	2	Format N	0. 4
col	JRSE NAME INST.	ALLATION, TESTING A	ND CO	MMISSIONING OF RAC	SYSTE	MS								
CO I	Description CO-1	Application of Basic tools	s, proce	edures for maintenance of l	RAC syst	tems								
LO [Description LO-2	Explain the procedure of us	sing cop	oper tubing tools for RAC sy	stems									
				SCHEME OF STUDY	•									
S.	l o	arning Content		Teaching -Learning	Des	script	ion of	T-L	-	Teach	Pra	ct./	LRs	Rem
No.	LC			(T-L) Method		Pro	cess			Hrs.	Tut	Hrs.	Required	arks NIL
1	refrigeration and Classification and tyrefrigeration and air	ypes of joints, connections ur conditioning systems. Pro aring, swaging, bending, pi	actices. used in ocedure	Interactive Classroom method, Handout, PPTs, Charts and Videos. Laboratory/Workshop demonstration		s a AE. S. T Quiz e stu	dents	provi outs r v Semi	to vill			4	ASHRAE handbook, Carrier Handbook Handouts, Charts, Videos	
	ı			SCHEME OF ASSESSMI	ENT									
S. No.	Method of Assessment		De	scription of Assessment					N	Maximı Mark		Resou Requ		ernal / ernal
1	Laboratory work	Student will prepare a give 1. Tube cutting/ Tube brazing		und/or) Tube swaging/ Tube ben	ding/ Tu	be pi	nching	t/ Tul	oe	10		Tools	S Exte	rnal

RG	PV (Dinlor	na Wing) Bhopal	SCHEME FO	R LEARNING OUTCOME	Branch Code	Co	urse Code		lo pode Format N	/
	i v (Dipioi	iia wiiig / biiopai	SCHEWIE	N LLAMINIO OO ICOME	R 0	1 6	0 2	1	3 Formativ	O. ¬
COL	JRSE NAME	INSTALLATION, TES	STING AND CO	MMISSIONING OF RAC	SYSTEMS					
CO [Description	CO-1 Application of I	Basic tools, proce	dures for maintenance of I	RAC systems					
LO [escription	LO-3 Describe procedu	re for refrigerant	charging in RAC system						
	-	'		SCHEME OF STUDY	,					
		1		Teaching –Learning	Description	of T-L	Tea	h Pract.	/ LRs	Re
S.										ar
_		Learning Content		(T-L) Method	Proces	S	Hrs	. Tut Hr	s. Required	aı
No.	System Eva	ncuations, System Pump	Down, Leak	(T-L) Method Interactive Classroom	Proces Teacher will e		he 6	. Tut Hr	ASHRAE	N
No.			• '	, ,			he 6	. Tut Hr		
No.	testing metl	acuations, System Pump	, Halide torch,	Interactive Classroom	Teacher will e contents and	xplain t provi	he 6	. Tut Hr	ASHRAE	

conduct Quiz/Visit/Seminar

to make students practice

their knowledge

Handouts,

Charts,

Videos

demonstration

types- Splash, Pressure.

S.	Method of	Description of Assessment	Maximum	Resources	External /
No.	Assessment		Marks	Required	Internal
1	Theory Exam	Student will be asked about (and/or) 1. Describe System Evacuation / System Pump Down/ Leak testing methods/ Refrigerant gas charging/ Lubricants and System Lubrication in RAC systems	10	Test Paper	External

RG	DV (Dinlor	na Wing) Bhopal	SCHEME EO	R LEARNING OUTCOME	<u> </u>	Branch Co	ode	Cou	rse Co	ode	CO Code	LO Code	Format	/
110	ir v (Dipioi	ila willg / bilopai	SCHEWIE 1 O	N LLANINING GOTCOM	R	0	1	6	0	2	1	4	Format	NO. 🛨
COL	JRSE NAME	INSTALLATION, TE	STING AND CO	MMISSIONING OF RAC	SYSTI	EMS								
CO	Description	CO-1 Application of l	Basic tools, proce	dures for maintenance of	RAC sy	stems								
LO	Description	LO-4 Explain working	with Sheet metal	for making ducts										
				SCHEME OF STUDY	1									
S. No.		Learning Content		Teaching -Learning (T-L) Method	D	escript Pro	ion o	f T-L		Teach Hrs.		ct. / Hrs.	LRs Required	Rem arks
1	for Sheet	t metal tools and equipm metal cutting, bending pplication of insulation ducts	g, riveting and	Interactive Classroom method, Handout, PPTs, Charts and Videos. Laboratory/Workshop demonstration	ASHR studen	ts a AE. ts. T et Quiz ke stu	and Hand Feache Z/Visit Idents		le to ill ar	4		0	ASHRAE handbook Carrier Handbook Handouts, Charts, Videos	,
				SCHEME OF ASSESSM	ENT									·
S. No.	Method Assessmo		Des	scription of Assessment					N	/laximu Mark		Resou Requ		ernal / ternal
1	Progressive Test I	2. Explain	sheet metal tools, o	equipments and their handling heet metal cutting/ Sheet ring	_	ending	/ Shee	et meta	1	5	I	Pen Pa	nper Inte	ernal

RG	PV (Dinlor	ma Wing) Bhopal	SCHEME FO	R I FARNINO	OUTCOME		ch Code	c	ourse Co	de		o de Format N	. 1
	i v (Dipioi	na wing / bhopai	JOINE ! O		3 00 100 1112	R	0 1	6	0	2	1	5 Formativ	io. -
COL	JRSE NAME	INSTALLATION, TES	STING AND CO	MMISSIONI	NG OF RAC	SYSTEMS	S						
CO I	Description	CO-1 Application of H	Basic tools, proce	dures for ma	intenance of l	RAC systen	ns						
LO [Description	LO-5 Describe tube join	ning for refrigerat	tion and air co	nditioning pla	nts							
				SCHE	ME OF STUDY	7							
S.		Lagraina Contant		Teaching	-Learning	Desci	ription	of T-L	1	Геасh	Pract.	/ LRs	Re
No.		Learning Content		(T-L) N	/lethod		Process			Hrs.	Tut Hr	. Required	arl
1		razing practices for diffrigeration and air cond		Interactive	Classroom ndout, PPTs,	Teacher	will ex and	plain prov		5		ASHRAE handbook,	NI
		rods, filler materials	U 1	Charts and V		ASHRAE.		douts	to			Carrier	
	welding/Braz	zing.	-	Laboratory/V	Workshop	students.	Teach	er v	vill			Handbook	
				demonstration	on	conduct (Quiz/Vis	it/Semi	nar			Handouts,	
						to make	students	nract	ice			Charts,	
						their know		Pract				Videos	

S.	Method of	Description of Assessment	Maximum	Resources	External /
No.	Assessment		Marks	Required	Internal
1	Progressive Test I	 Student will be asked (and/ or) Describe welding/Brazing procedures for given materials used in refrigeration and air conditioning plants Enlist types of welding rods/ types of filler materials Explain safety measures for welding/brazing procedure 	5	Pen Paper	Internal

DC	DV /Diplor	na Wing \ Phanal	SCHEME EO	R LEARNING OUTCOME		Branch	Code	Co	urse Co	ode	CO Code	LO Code	_		1
NU	וטוקוטן אין	na Wing) Bhopal	SCHEIVIE FO	TR LEARINING OUTCOME		R O	1	6	0	2	1	6	Form	at No). 4
COL	JRSE NAME	INSTALLATION, TE	STING AND CO	MMISSIONING OF RAC	SYS	STEMS									
CO	Description	CO -1 Application of l	Basic tools, proce	edures for maintenance of I	RAC	systems									
LO [Description	LO-6 Analyze Basic E	lectrical and Elect	ronics circuits of RAC plants											
	I			SCHEME OF STUDY								ı			
S. No.		Learning Content		Teaching —Learning (T-L) Method		Descrip Pr	otion o ocess	f T-L		Teach Hrs.		ct. / Hrs.	LR: Requi		Ren ark
1	current, volt phase connect terminals of a of DOL start and connect Identification resistors, tra	chase connection of motors. Identification of the derminals of sealed compressor and their windings, use of DOL starter with different types of motors. Testing and connection of relays used in sealed motors. Identification of the electronic components. Testing of resistors, transistor, capacitor, diode, amplifier, IC PCB Soldering and de soldering Charts and Videos. Laboratory/Workshop demonstration demonstration ASHRAE. Handow students. Teacher conduct Quiz/Visit/Stormake students to make students their knowledge SCHEME OF ASSESSMENT Method of							de to vill	2		8	ASHR handbo Carrier Handb Hando Charts Videos	ook, r ook uts,	NII
				SCHEME OF ASSESSME	ENT									·	
S. No.	Method Assessm		De	scription of Assessment					r	Maximu Marks		Resou Requ		Exter Inte	-
1	Laboratory by observat	Description of Assessment Student will be asked (and/or) 1. Explain electrical safety and different wire joints/ Measurement of current, vo							L d	10		Tools Electri and electro meters	cal	Intern	ıal
			ADDITIONAL IN	NSTRUCTIONS FOR THE HO	DD/	FACULT	Y (IF A	NY)							

			В	ranch Coo	de	C	ourse C	ode	CO Code	LO Code	
RGPV (Diplor	ma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	R	0	1	6	0	2	2	7	Format No. 4
COURSE NAME	INSTALLATION, TES	STING AND COMMISSIONING OF RAC SY	STEN	MS							1
CO Description	CO-2 Commissioning of	of given RAC Plants									
LO Description	LO-7 Plan RAC projec	ets									
		SCHEME OF STUDY									

		SCHEME OF STUDY					
S.	Learning Content	Teaching -Learning	Description of T-L	Teach	Pract. /	LRs	Rem
No.	Learning Content	(T-L) Method	Process	Hrs.	Tut Hrs.	Required	arks
1	RAC plant layout, Parameters Affecting the location.	Interactive	Teacher will explain the	8	0	ASHRAE	NIL
	Organizational approach. Erection methodology. Foundation,	Classroom method,	contents and provide			handbook,	
	padding, network analysis: CPM & PERT, safety	Handout, PPTs,	ASHRAE. Handouts to			Carrier	
	precautions, air handling equipment's locations in the	Charts and Videos.	students. Teacher will			Handbook	
	systems, corrosion control. HVAC System balancing:		conduct			Handouts,	
	Capacity control of Compressor, Condenser, Evaporator.		Quiz/Visit/Seminar to			Charts,	
	Water Balancing Procedures Using Flow Meters, Analog		make students practice			Videos	
	And Digital Controls		their knowledge				

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Progressive	Students will be asked (and/or)	10	Project	Internal
	Test II	 Explain the working on a Refrigeration/ Air-conditioning plant layout and Parameters Affecting the location of a plant. Describe the Erection methodology for RAC plants. Explain the terms Foundation/ Padding/ CPM/ PERT/ Safety precautions/ Air handling equipment's locations in the systems/ Corrosion control Describe the terms HVAC System balancing/ System Capacity control (Compressor, Condenser, Evaporator)/ Analog And Digital Controls/ Water Balancing Procedures Using Flow Meters 		report	

D.C	DV /Diplom	a Wing) Bhopal	SCHEME FOR LEAI	DNING OUTCOME	Brand	h Code		Cou	rse Cod	de	CO Code	LO Code	_		1
NG	iPV (Diploili	a wing / bhopai	SCHEIVIE FOR LEAI	RIVING OUTCOME	R	0	1	6	0	2	2	8	Forma	at No	·. 4
COI	JRSE NAME	INSTALLATION, TES	STING AND COMMIS	SIONING OF RAC SYS	TEMS										
CO	Description	CO-2 Commissioning	of given RAC Plants												
LO I	Description	LO-8 Testing of given	RAC plants												
				SCHEME OF STUDY											
S. No.		Learning Conte	nt	Teaching –Learning (T-L) Method	Des	•	tion oces:	of T-L s		each Hrs.	Prac Tut	•	LRs Requi		Rem arks
1	Instruments R Quality, Powe And Its Prod Variable Air	equired for – Pressure, r, Harmonics Etc. Gener cedures For Constant		Videos	the provi Hand Teacl Quiz	cor de outs er v Visit stud	to swill /Sem	SHRAE students conductions ninar to practic	ad E. s. et	4	•		ASHRA handbo Carrier Handbo Handoo Charts, Videos	ook, ook uts,	NIL
			SCH	IEME OF ASSESSMENT											
S. No.	Method o		Description	on of Assessment						laximu Marks		Resoι Requ		Exteri Inter	-
1	Laboratory W	Assessment Laboratory Work Students will be asked (and/or) 1. Enlist Codes And Standards Related To HVAC&R Projects/ Instruments Refor – Pressure, Temperature, Flow, Air Quality, Power, Harmonics Etc. 2. Describe general/specific testing and its Procedures For Constant Air V Systems/ Variable Air Volume Systems/ Return Air Systems 3. Explain working/testing performance of cooling towers								10		Pen P √iva	aper/ l	Exterr	nal

4. Testing of fan's performance

DC	DV /Diploy	es Wing \ Phonol	SCHEME FO	D LEADNING OUTCOME		ranch Co	de	С	ourse	Code	CO Code	LO Code	_	1
KG	PV (Diplon	na Wing) Bhopal	SCHEIVIE FO	R LEARNING OUTCOME	R	0	1	6	0	2	2	9	Format	No. 4
COL	JRSE NAME	INSTALLATION, TES	STING AND CO	MMISSIONING OF RAC	SYSTE	MS							ı	
CO [Description	CO-2 Commissioning o	of given RAC Plan	nts										
LO [Description	LO-9 Execute RAC plan	nt Commissioning											
				SCHEME OF STUDY	,									
S. No.		Learning Content		Teaching –Learning (T-L) Method	Des	script Pro	ion of cess	T-L		Teach Hrs.		ct. / Hrs.	LRs Required	Ren arks
1	Benefit Anal Of Comm Commissioni Commissioni	oduction to Commissioning, Objectives of Interactive Classroom Contents and Programmissioning, Benefits of Commissioning. Cost efit Analysis. Levels of commissioning. Selection Charts and Videos Teacher will explain contents and programmissioning. Cost Charts and Videos ASHRAE. Handouts						provouts r v/Semi	to vill	6		0	ASHRAE handbook Carrier Handbool Handouts Charts, Videos	ζ
				SCHEME OF ASSESSM	ENT								I	
S. No.	Method of Assessmen		Desc	cription of Assessment						Maxi Ma				xternal nterna
1	Theory Exam	 Explain the Object Describe Cost Boundary The Householder 	tives/ Benefits / p enefit Analysis/ IVAC Commissi	procedure of Commissioning Levels of commissioning/ ioning Team/ Comprehen- ag/ HVAC Commissioning I	Selection Sive HV	AC C	Comm				0	Tes		xternal

D.C	DV (Diplor	ma Wing) Bhopal	SCHEME EO	R LEARNING OUTCOME		Branc	h Cod	e	Co	ourse C	Code	CO Code	LO Code		1
NG	iev (Dipioi	iia wiiig <i>j</i> biiopai	SCHEWIE FO	I LLAKINING OUTCOME	•	R	0	1	6	0	2	3	10	Forma	t No. 4
col	JRSE NAME	INSTALLATION, TE	STING AND CO	MMISSIONING OF RAC	SYS	STEMS									
CO I	Description	CO-3 Describe Projec	t Management of	HVAC&R											
LO [Description	LO-10 Explain HVAC	C&R Project repor	ts											
				SCHEME OF STUDY	,										
S. No.		Learning Content		Teaching –Learning (T-L) Method		Descri F	•		f T-L		Teach Hrs.		ct. / Hrs.	LRs Requir	Rem ed arks
1	Communicat preparation Working on demand, pr stratification	tve of project report, need of Technical unication: Interpersonal Skills, Report ation skills, Professional Ethics. Reading and ag on CAD Drawings. Preparation of project ation, comparison of various systems for aced performance, Bill of Quantities, Payable of system (I-L) Method (Interactive Classroom method, Handout, PPTs, Charts and Videos Teacher will expressional expressional Ethics. Reading and Shrake. Handout, PPTs, Charts and Videos SCHEME OF ASSESSMENT						d Iando eache Visit ents	provi outs er w /Semin	to vill	8		0	ASHRA handboo Carrier Handboo Handou Charts, Videos	ok, ok
				SCHEME OF ASSESSME	ENT										·
S. No.	Method Assessm		De	scription of Assessment						1	Maxim Mark		Resou Requ		xternal / Internal
1	Theory Exar	1. Describe Report pour and Work 2. Explain I stratificat	the Objectives or reparation skills/ laking on CAD Dramow to prepare pration	of project report/ Need of Professional ethics/ The producings roject demand/ Project detail Bill of Quantities/ Payable per	cedui	re and s	teps assı	for	Readir	ng	10		Test Paper		xternal

DC	DV /Diplon	na Wing) Bhopal	SCHEWE EU	R LEARNING OUTCOME	<u>.</u>	Branch	Code	Co	ourse C	ode	Code	Code	_	1
NG	ווטוקוטו	iia wiiig / biiopai	SCHEIVIE FO	A LEAKINING OUTCOME	F	₹ () 1	6	0	2	3	11	Forma	t No. 4
COL	JRSE NAME	INSTALLATION, TE	ESTING AND CO	MMISSIONING OF RAC	SYST	EMS								
CO [Description	CO-3 Describe Projec	ct Management of l	HVAC&R										
LO [escription	LO-11 Prepare Tender	r Estimation docun	ment for given project										
				SCHEME OF STUDY	<u> </u>									
S. No.		Learning Content		Teaching –Learning (T-L) Method			ption o			Teach Hrs.		ct. / Hrs.	LRs Requir	Rei ed ark
1	diversity assivarious syste	of project demand, suming, air stratification ems for optimized perf ayback period of system	n, comparison of formance, Bill of	Interactive Classroom method, Handout, PPTs, Charts and Videos	ASHI studer conduto m	nts RAE. nts. uct Qu	and Hand Teach aiz/Visitudents		to vill	2		6	ASHRA handbo Carrier Handbo Handou Charts, Videos	ok, ok
				SCHEME OF ASSESSM	ENT							ı		
S. No.	Method Assessme		De	scription of Assessment						Maxim Mark		Resou Requ		xternal Internal
1	Laboratory \	 Prepare Prepare 	Tender Estimation Bill of Quantities f	document for given project for given RAC project of system of given RAC proj						10		Pen pa Viva	aper/ F	External
				NSTRUCTIONS FOR THE HO				•						

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DC	'DV /Diplome \A/	ing \ Phonol	COUENIE FO			Branch Co	ode	Cou	irse Co	de	CO Code	LO Code			1
ΚŪ	iPV (Diploma W	ing / bhopai	SCHEIVIE FO	R LEARNING OUTCOME	R	0	1	6	0	2	3	12	Format	No. 4	+
col	JRSE NAME INST	ALLATION, TE	STING AND CO	MMISSIONING OF RAC	SYSTE	MS									
CO I	Description CO-3	Describe Project	Management of H	IVAC&R											
LO [Description LO-12	2 Present project p	olan, tender docun	nent for given project											
				SCHEME OF STUDY	•										
S. No.	Le	earning Content		Teaching –Learning (T-L) Method	De	•	ion of	T-L		Геасh Hrs.		ct. / Hrs.	LRs Require		em rks
1	preparation of Mult	ojects, Highlighting Design Challenges/ Charts and Videos ASHRAE. Handouts					providuts r w:/Semin	le to ill ar	10		0	ASHRAI handbool Carrier Handboo Handouts Charts, Videos	ξ, k	ΠL	
				SCHEME OF ASSESSMI	ENT										
S. No.	Method of Assessment		De	scription of Assessment					N	laximı Mark	·	Resou Requ		terna Iterna	•
1	Term Work	 Case Student Highlight 	ve to give Presenta dies Of Critical Pr ting Design Challo sioning Tasks	3	ject givei	n: (any	y one)			10		Proje report Semin Hall	/	ernal	

D.C	DV /Diplos	na Wing \ Phonal	SCHEME FO	R LEARNING OUTCOME		Branch Co	de	С	ourse Co	ode	CO Code	LO Code	_	1
ΝŪ	iev (Dibion	na Wing) Bhopal	SCHEIVIE FO	R LEARINING OUTCOME	R	0	1	6	0	2	4	13	Format	No. 4
COL	JRSE NAME	INSTALLATION, TE	STING AND CO	MMISSIONING OF RAC	SYSTE	MS							<u> </u>	
CO I	Description	CO-4 Describe RAC I	Plant Operations											
LO [Description	LO-13 Describe manu	al operation of RA	AC plants										
				SCHEME OF STUDY	,									
S. No.		Learning Content		Teaching –Learning (T-L) Method	Des	script Pro		f T-L		Teach Hrs.		ct. / Hrs.	LRs Require	Rem ed arks
1	parameters Temperature, interpretation	panels layout and reading, RAC system ers to observe and maintain: Pressure, atture, flow. Reading gauges and their tations. log book management, Limitations of y operated plants (I-L) Method (I-L) M						provouts er v /Semi	to vill	2		5	ASHRA handboo Carrier Handboo Handout Charts, Videos	k, ok
				SCHEME OF ASSESSMI	ENT								1	
S. No.	Method of Assessment Description of Assessment								N	Maximı Mark		Resou Requ		cternal /
1	Laboratory N By observati	1. Describe 2. Explain 3. Explain	e Control panels and how to read gauge procedure to maint	nd different parameters to obsess, their interpretations. cain log book of RAC Plants ually operated plants		l maint	ain			10	-	Indust Visit	rial in	ternal

D.C	DV / Diplor	ma Wing \ Phonal	SCHEME EO	AD LEADNING OUTCOME		Branch	Code	Cour	se Co	de	CO Code	LO Code	_		1
ΚŪ	PV (Dipioi	na Wing) Bhopal	SCHEWIE FO	R LEARNING OUTCOME		R O	1	6	0	2	4	14	Forn	nat No). 4
COL	JRSE NAME	INSTALLATION, TE	STING AND CO	MMISSIONING OF RAC	SY	STEMS									
CO	Description	CO-4 Describe RAC P	lant Operations												
LO [Description	LO-14 Explain IBMS in	n HVAC systems												
				SCHEME OF STUDY	,										
S. No.		Learning Content		Teaching –Learning (T-L) Method		Descrip Pr	otion o	f T-L		Teach Hrs.	Pra Tut	•	LF Requ	-	Ren arks
1	IBMS, systematics building systematics Introduction	to IBMS, Functions of II em architecture, interactems(Lighting, Fire safe To LONWORKS, BAG standards. Controlling main IBMS	tion with other ty, CCTV etc.), Cnet, MODBUS	Interactive Classroom method, Handout, PPTs, Charts and Videos	PPTs, Teacher will explain contents and proving ASHRAE. Handouts students. Teacher viconduct Quiz/Visit/Semito make students practitheir knowledge					8	()	ASHI handb Carrie Handb Handb Chart Video	book, er book outs, s,	NIL
	'			SCHEME OF ASSESSMI	ENT	•				·					
S. No.	Method Assessm		De	scription of Assessment					N	/laximu Marks		Resou Requ		Exter Inte	•
1	Theory Exa	 Explain IBN with other b Describe the 	AS/ Functions of I uilding systems (I term LONWOR)	BMS/ benefits of IBMS/ Sys Lighting, Fire safety, CCTV KS/ BACnet/ MODBUS/ Int ods of HVAC Components in	etc.) terne) et standard		eraction		10	I	Test Paper		Exter	nal
			ADDITIONAL IN	NSTRUCTIONS FOR THE HO	DD/	FACULT	Y (IF AI	NY)							

PGDV /Diploy	ma Wing) Bhopal	SCHEME FOR LEARNING OUTCOME	В	Branch Co	de	C	ourse Co	ode	Code	Code	/
KGPV (Diploi	iia wiiig / biiopai	SCHEWIE FOR LEARNING OUTCOME	R	0	1	6	0	2	5	15	Format No. 4
COURSE NAME	INSTALLATION, TE	STING AND COMMISSIONING OF RAC SY	STE	MS							
CO Description	CO-5 Explain the pro	ocedure to repair for given RAC systems									
LO Description	LO-15 Explain the pro	cedure to resolve possible faults for Refrigeration	syste	ms							
		SCHEME OF STUDY									

		SCHEME OF STUDY					
S.	Learning Content	Teaching -Learning	Description of T-L	Teach	Pract. /	LRs	Rem
No.	Learning Content	(T-L) Method	Process	Hrs.	Tut Hrs.	Required	arks
1	Step by step procedure for trouble shooting of	Interactive Classroom	Teacher will explain the	10	0	ASHRAE	NIL
	Refrigeration system with reference to Possible faults-	method, Handout, PPTs,	contents and provide			handbook,	
	diagnosis- solution with the help of Trouble shooting	Charts and Videos	ASHRAE. Handouts to			Carrier	
	charts:		students. Teacher will			Handbook	
	a. System not starting		conduct Quiz/Visit/Seminar			Handouts,	
	b. System starts but no cooling		to make students practice			Charts,	
	c. Less cooling then indicated		their knowledge			Videos	
	d. Frequent tripping/ short cycle						
	e. Frosting in evaporator/ at expansion device						
	f. System making noise						
	g. System runs continuously without stopping						

S.	Method of	Description of Assessment	Maximum	Resources	External /
No.	Assessment		Marks	Required	Internal
1	Theory Exam	Students will be asked 1. Explain the step by step procedure for trouble shooting of a Refrigeration system with reference to Possible faults- diagnosis- solution for (and/or) a. System not starting b. System starts but no cooling c. Less cooling then indicated d. Frequent tripping/ short cycle e. Frosting in evaporator/ at expansion device f. System making noise g. System runs continuously without stopping	10	Test paper	External

PGDV /Diplo	ma Wing) Bhopal	R 0 1 6 0 2 5 16		1									
KGPV (Diplo	ilia wilig / bilopai			R 0 1 6 (R 0 1 6 0			5	16	Format No	. +
COURSE NAME	INSTALLATION, TE	STING AND CO	MMISSIONING OF RAC	SYSTE	MS								
CO Description	CO-5 Explain the pro	cedure to repair	for given RAC systems										
LO Description	LO-16 Explain the pro	cedure to resolve	possible faults for Air condit	ioning sy	ystems								
			SCHEME OF STUDY										

		SCHEME OF STUDY					
S. No.	Learning Content	Teaching –Learning (T-L) Method	Description of T-L Process	Teach Hrs.	Pract. / Tut Hrs.	LRs Required	Rem arks
1	Step by step procedure for trouble shooting of Air conditioning system with reference to Possible defects- diagnosis- solution with the help of Trouble shooting charts: a. System not starting b. System starts but no air cooling c. Less air cooling then indicated d. Frequent tripping/ short cycle e. Frosting in evaporator/ at expansion device f. System making noise g. System runs continuously without stopping	Interactive Classroom method, Handout, PPTs,	Teacher will explain the contents and provide ASHRAE. Handouts to students. Teacher will conduct Quiz/Visit/Seminar to make students practice their knowledge	10		ASHRAE handbook, Carrier Handbook Handouts, Charts, Videos	NIL

S.	Method of	Description of Assessment	Maximum	Resources	External /
No.	Assessment		Marks	Required	Internal
1	Theory Exam	 Students will be asked Explain the step by step procedure for trouble shooting of a Air conditioning system with reference to Possible faults- diagnosis- solution for (and/or) System not starting System starts but no air cooling Less air cooling then indicated Frequent tripping/ short cycle Frosting in evaporator/ at expansion device System making noise System runs continuously without stopping 	10	Test Paper	External