RGPV (D	IPLOM BHOPA		i)		IRRICULUM HE COURSE	FORMAT-3	She	et No.	1/3		
Branch	RI	EFRIGERA	ATION	N and AIR	CONDITIONING	Semester			v		
Course Co	de	504	Cou	rse Name	Refrigeration ar Drawing	nd Air Conditio	ning				
Course Outo	come 1	Describ Sections	3	,	i view representatio	n and		Teachin Hrs	g	Mar	ks
Learning Ou	itcome	represer	ntation		tions and multi-viev			7			LO
Projection: orthographic projection. First and third angle projection, superfluous view, choice of views, auxiliary views - full and partial, conversion of pictorial views in to orthographic views, conventional representation as per IS: 696.											
Method of As	sessmen	t Paper-P	Pen Tes	t (Prg. 1)						Inte	ernal
Learning Ou	itcome 2	tcome 2 Explain Sectional views. view with front/top view of a given part. 7							1	10	
Sectional Views: Full section, half section, partial or broken section, revolved section removed section, offset section. Sectioning conventions, section lines. Hatching proceed for different materials as per IS code 686 1972. Sectional views of assembled Choosing from IC engine parts, couplings, clutches, brackets, bearing etc. (Use 1st angle projection)						edure					
Method of As	sessmen	t Paper-P	Pen Tes	t (TW)						Interi	nal
Course Ou	tcome 2				ance, machining, components Symbol	s and line diagra	m.	Teach Hr	_	ng Marks	
Learning Ou	itcome (of dimensioning and			5+			10
Conter	nts	code) g	general	l rules for Dimension	e and location) dime dimensioning and of cylinder holes are tc. Application of to	practical hints cs of circle narro	on di w spa	imension ace, angle	ing es, co	systei	ms of
Method of As	sessmen	t Laborat	tory te	st					In	iterna	.1
Learning Ou	itcome 4	practice.								10	
Conter	Machining and surface finish symbols, Representation, , tolerance of forms and position RAC main and auxiliary Equipments its control symbols, Electrical equipment transformers controls, motors. Transformer Starters etc. Civil material symbols building symbols doors, window, ventilator, roof wall etc.						nents,				
Method of As	sessmen	t Theory I	Exam						ı	Exte	rnal
Learning Ou	tcome !	Sketch l	Line D	iagram of v	rarious RAC system	ns				7	10
Conter	nts	Refriger	Refrigeration and Air Conditioning. Line diagramme air refrigeration ,VCRS ,VA							,VAB	

,V	RF/VAV , A	ir And Wate	er Chillers .Coolin	g Tower ,Evapora	ative Coo	ling		
Method of Assessment T	neory Exam							
RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE						
Branch	F	_	ion and Air- tioning	Semester		V		
Course Code	504 Cour	rse Name	Refrigeration	and Air Condit	ioning I	Drawing		
Course Outcome 3	Draw different components of a duct fitting and Sheet Metal Work Symbols & its Drawing. As per ASHRAE. Teaching Ma						Marks	
Learning Outcome 6	Sketch various Sheet Metal Work Symbols. 7							
Contents	symbols, riv	Welding Symbols Forms and symbols of seams, pipe fitting symbols, machining symbols, riveted and welding Joints in sheet metal construction and its symbols used joints/ bends.						
Method of Assessment	Paper-Pen 7	Paper-Pen Test(prg.2) Inte						
Learning Outcome 7	Draw different components of a duct fitting Symbols . 7 10						10	
Contents	Fitting round and rectangular fittings, Elbow, screen Damper, Butterfly, Duct Mounted in Bell mouth, with Wall, Conical Diffuser, Round to Plenum, Exhaust/Return Sy Transition, Exhaust/Return Systems, Wye Converging, Tee converging, Centrifuga Located in Plenum or Cabinet, Bell mouth, Transition, Wye, Diverging, Tee, Diverging Conical Branches, obstruction, pyramid, diffuser, abrupt exit, dovetail.						Systems, ifugal Fan	
Method of Assessment	Theory Exa	ım				E	xternal	
Course Outcome 4	Construct v	arious types	of Graphs And C	Charts.	Т	eaching Hrs	Marks	
Learning Outcome 8	Classify and	l draw differ	ent types of Grap	h and Charts		12	15	
Contents							qualitative or making bar charts	
Method of Assessment	Theory Exam Externa							
Learning Outcome 9	Draw varia	able relation	nship Scale Cha	rts		1+5	10	
Contents	Forms and construction of functional scale, parallel scale charts for equations of the form $[f(t)+f(v), (f(t) \times f(u) = f(v)]$ three scale alignment chart, graphical construction a Z chart, four variable relationship parallel scale alignment chart.							
Method of Assessment	Laboratory test							

				Internal	_				
RGPV (DIPLOMA WING) BHOPAL	OBE C	OBE CURRICULUM FOR THE COURSE							
Branch	Refrigera	Refrigeration and Air-conditioning Semester							
Course Code	504	504 Course Name Refrigeration and Air Conditioning Drawing							
Course Outcome 5	Construct I CAD Softw	Refrigeration & Ai are.	r conditioning d	rawing using a	Т	Teaching Hrs	Marks		
Learning Outcome 10	Execute dra software.	Execute draw and modify commands used in CAD 8 10							
Contents	hatch. Eras	Coordinate system, Drawn command-line, arc, circle rectangle, polygon, point, ellipse, hatch. Erase, copy, offset, array, trim, extend, break, join, chamfer, fillet, move, rotate, scale, stretch, lengthe, Dimensioning Tray settings: snap, grid, ortho, polar, osnap.							
Method of Assessment	Theory Exa	am							
Learning Outcome 11	Execute for software.	rmat and construct	ion commands ı	ised in CAD		2+10	30		
Contents		nmands: line type, t styles, formatting		-	_		sion style,		
Method of Assessment	t Laboratory test								
Learning Outcome 12	Construction of drawing using Auto CAD. 8						15		
Contents Application of Auto C AD: practice of Refrigeration & Air conditioning drawings using AutoCAD Presentation: Block. creating layout, insert layout. plotting printing									
Method of Assessment	Theory Ex	am							

SCHEME FOR LEARNING OUTCOME

	LO Code	CO Code	Course Code			Branch Code		
Format No. 4	1	1	4	0	5	0 1		

COURSE NAME Refrigeration and Air-Conditioning Drawing										
CO Description	CO Description CO-1 Describe Projection, Multi View Representation And Sectional Views.									
LO Description	LO-1 Define Concepts Of Projections And Multi-View Representation.									

SCHEME OF STUDY

S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Projection: orthographic projection. First and third angle projection, superfluous view, choice of views, auxiliary views- views -full and partial, conversion of pictorial views in to orthographic views, conventional representation as per IS: 696.	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	7		Handouts, Charts, Videos	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper-Pen Test (Prg. 1)	Student will be asked to define Projection, orthographic projection. First and third angle projection.	10	Test Paper	Internal

SCHEME FOR LEARNING OUTCOME

В	ranch Cod	le	Co	ourse Co	de	CO Code	LO Code	
R	0	1 5 0 4				1	2	Format No

COURSE NAME	Refrigeration and Air-Conditioning Drawing
CO Description	CO-1 Describe Projection, Multi view representation and Sectional views.
LO Description	LO-2 Explain Sectional views. view with front/top view of a given part.

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks
1	Sectional Views: Full section, half section, partial or broken section, revolved section, removed section, offset section. Sectioning conventions, section lines. Hatching procedure for different materials as per IS code 686 1972. Sectional views of assembled parts. Choosing from IC engine parts, couplings, clutches, brackets, bearing etc. (Use 1st angle projection)	Handout, PPTs, Charts and	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	7		Handouts, Charts, Videos, Models of renewable power generation	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Paper-Pen Test (TW)	Student will be asked to explain a given sectional view with front/top view of a given part.	10	Paper Pen	Internal

SCHEME FOR LEARNING OUTCOME

Branch Code			Co	ourse Co	de	CO Code	LO Code	
R	0	1	5	0	4	2	3	Format No. 4

COURSE NAME	Refrigeration and Air-Conditioning Drawing
CO Description	CO-2: Draw dimensioning, tolerance, machining, Electrical, Civil & RAC components Symbols and line diagram
LO Description	LO-3 : Define/Explain concepts of dimensioning and tolerance.

SCHEME OF STUDY

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark s
1	Types of dimensions (size and location) dimensioning terms and notations. (Use of IS: 696 code) general rules for dimensioning and practical hints on dimensioning systems of dimensioning. Dimension of cylinder holes arcs of circle narrow space, angles, counter sunk hole, screw threads taper etc. Application of tolerances.(Use of IS:2709 code)	Interactive Classroom method, Handout, PPTs, Charts and Videos, Working Models of power utilization	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	5	2	Handouts, Charts, Videos, Working Models	NIL

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
1	Laboratory test	 Student will be asked to explain methods of dimensioning with the help of sketches. 2. Student will be asked to draw dimensions and tolerances on a given sketch. 	10	Working models	Internal

SCHEME FOR LEARNING OUTCOME

	LO Code	CO Code	de	urse Co	Co	Branch Code		
Format No. 4	4	2	4	0	5	1	0	R

COURSE NAME	Refrigeration and Air-Conditioning Drawing
CO Description	CO-2: Draw dimensioning, tolerance, machining, Electrical/Civil/RAC components Symbols and line diagram.
LO Description	LO-4 Draw basic machine/equipments symbols various necessary engineering practice.

SCHEME OF STUDY

S.No	Learning Content	Teaching -Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
1	Machining and surface finish symbols, Representation, , tolerance of forms and positions. RAC main and auxiliary Equipments its control symbols, Electrical equipments, transformers controls, motors. Transformer Starters etc. Civil material symbols building symbols doors, window, ventilator, roof wall etc.	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	7		Handouts, Charts, Videos	

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 draw machining and Electrical/ Civil / RAC components' symbols	10	Test Paper	External

SCHEME FOR LEARNING OUTCOME

	LO Code	CO Code	de	Course Code			Branch Code		
Format No. 4	5	2	4	0	5	1	0	R	

COURSE NAME	Refrigeration and Air-Conditioning Drawing
CO Description	CO-2: Draw dimensioning, tolerance, machining, Electrical/Civil/RAC components Symbols and line diagram.
LO Description	LO5- Sketch Line Diagram of various RAC systems.

SCHEME OF STUDY

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
	Refrigeration and Air Conditioning. Line diagrmme air refrigeration ,VCRS ,VAB ,VRF/VAV , Air And Water Chillers .Cooling Tower ,Evaporative Cooling		Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	7		Handouts, Charts, Videos	

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 Refrigeration and Air Conditioning. Line diagrmme air refrigeration ,VCRS ,VAB ,VRF/VAV , Air And Water Chillers .Cooling Tower ,Evaporative Cooling	10	Test Paper	External

SCHEME FOR LEARNING OUTCOME

_	LO Code	CO Code	de	Course Code			ranch Cod	В
Format No. 4	6	3	4	0	5	1	0	R

COURSE NAME	Refrigeration and Air-Conditioning Drawing
CO Description	CO- 3 Draw different components of a duct fitting and Sheet Metal Work Symbols & its Drawing As per ASHRAE Standards
LO Description	LO-6 Sketch various Sheet Metal Work Symbols

OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
1	Welding SymbolsForms and symbols of seams, pipe fitting symbols, machining symbols, riveted and welding Joints in sheet metal construction and its symbols used. joints/bends.	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	7		Handouts, Charts, Videos, ASHRAE Standards	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper-Pen Test(prg.2)	Student will be asked to Sketch Welding SymbolsForms and symbols of seams, pipe fitting symbols ,machining symbols , riveted and welding Joints in sheet metal construction and its symbols used	10	Test Paper	Internal

SCHEME FOR LEARNING OUTCOME

	LO Code	CO Code	de	urse Co	Co	e	anch Cod	Ві
Format No. 4	7	3	4	0	5	1	0	R

COURSE NAME	Refrigeration and Air-Conditioning Drawing
CO Description	CO 3 Draw different components of a duct fitting and Sheet Metal Work Symbols & its Drawing. As per ASHRAE
LO Description	LO-7 Draw different components of a duct fitting Symbols

SCHEME OF STUDY

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
	Fitting round and rectangular fittings, Elbow, screen Damper,	Interactive	Teacher will	7		Handouts,	
	Butterfly, Duct Mounted in Wall, Bell mouth, with Wall,	Classroom method,	explain the contents			Charts,	
	Conical Diffuser, Round to Plenum, Exhaust/Return Systems,	Handout, PPTs,	and provide			Videos	
	Transition, Exhaust/Return Systems, Wye Converging, Tee	Charts and Videos.	handout to students.				
	converging, Centrifugal Fan Located in Plenum or Cabinet, Bell		Teacher will				
	mouth, Transition, Wye, Diverging, Tee, Diverging Cross,		conduct Quiz/visit				
	Conical Branches, obstruction, pyramid, diffuser, abrupt exit,		to make students				
	dovetail		practice their				
			knowledge				

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Theory Exam	Student will be asked to drawFitting round and rectangular fittings, Elbow, sreen Damper, Butterfly, Duct Mounted in Wall, Bellmouth, with Wall, , Wye DiffuserTee converging, Cross,	10	Test Paper	External

SCHEME FOR LEARNING OUTCOME

<u> </u>	LO Code	CO Code	de	urse Co	Co	e	ranch Cod	В
Format No. 4	8	4	4	0	5	1	0	R

COURSE NAME	Refrigeration and Air-Con	ditioning Drawing		·	·	·	·	·		
CO Description	CO- 4 Construct various type	es of Graphs And Cha	arts.							
LO Description	LO-8 Classify and draw diffe	rent types of Graph a	and Charts							

SCHEME OF STUDY

S. No	. Learning Content	T-L Method	Description of T-L Process	Tea ch Hrs	Pract. /Tut Hrs.	LRs Required	Rem ark
	Introduction, Classification of charts. graphs and diagrams, quantitative and qualitative charts and graphs. Drawing and curve titles, legends notes etc. Procedure for making graphical representation in ink. logarithmic graphs, semi-logarithm graphs, bar charts area (Percentage) charts, pie charts, alignment charts (Nomo graphs)	Interactive Classroom method, Handout PPTs, Charts and Videos.	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	12		Handouts, Charts, Videos, Experiment al setup for dryness fraction	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Theory Exam	Student will be asked to Classification of charts. graphs and diagrams, quantitative and qualitative charts and graphs.	15	Test Paper	External

RC	GPV (Dip	oloma Wing)	SCHEME FOR	LEARNING	B	ranch Co	de	С	ourse Code)	CO Code	LO Code		4
	Bh	nopal	OUTCO	OME	R	0	1	5	0	4	4	9	Forma	at No. 4
COUR	SE NAME	Refrigeration and Air	-Conditioning Drawi	ng	l		1	ı	<u> </u>				I	
CO De	scription	CO- 4 Construct variou	us types of Graphs And	Charts										
LO Des	scription	LO-9 Draw variable r	elationship Scale Cha	rts										
				SCHEME OF S	STUDY									
S. No.		Learning Cont	ent	T-L Method	Desc	riptio Proce		Γ-L	Teacl Hrs.		Pract. /Tut Hrs.	LRs R	Required	Remarl
	scale chart f(u) = f(construction	d construction of functions for equations of the formula three scale alignment on of a Z chart, four the alignment chart.	orm[$f(t)+f(v)$, $(f(t) \times c)$ nent chart, graphical	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teache the con provide student determine	tents a hando s. Exp nation	and out to erime		1		5		s, Videos, imental	
			S	CHEME OF ASS	ESSME	NT								
S. No.	Method Assessme		Description of As	ssessment				Maximum Marks			Resources Required		External ,	/ Internal
	Laboratory	'	ked to draw Forms and ts for equations of the f ent chart			′					Experime Setup	ntal I	nternal	
			ADDITIONAL INSTR	UCTIONS FOR 1	тне но	D/ FA	CULT	Y (IF	ANY)					

SCHEME FOR LEARNING OUTCOME

В	ranch Co	de	Co	ourse Co	de	CO Code	LO Code	
R	0	1	5	0	4	5	10	Format No. 4

COURSE NAME Refrigeration and Air-Conditioning Drawing					
CO Description CO-5 Construct Refrigeration & Air conditioning drawing using a CAD Software.					
LO Description	LO-10 Execute draw and modify commands used in CAD software.				

SCHEME OF STUDY

S. Learning Co	Learning Content		Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
Coordinate system, Dra arc, circle rectangle, ellipse, hatch. erase, c trim, extend, break, joi move, rotate, scale, Dimensioning Tray set ortho, polar, osnap.	polygon, point, opy, offset, array, n, chamfer, fillet, stretch, lengthe.	Interactive Classroom method, Handout, PPTs, Charts and Videos. Models of boilers, mountings and accessories	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	8		Handouts, Charts, Videos, Experimental setup for dryness fraction	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Theory Exam	Student will be asked to Execute draw command-line, arc, circle, rectangle, polygon, point, ellipse, hatch. erase, copy, offset, array, trim, extend, break, join, chamfer, fillet, move, rotate, scale, stretch, lengthe.	10	Test Paper	External

RGPV (Diploma	na SCHEME FOR LEARNING OUTCOME		Branch Code		Course Code			CO Code	LO Code	Format No.
Wing) Bhopal		R	0	1	5	0	4	5	11	4
COURSE NAME	Refrigeration and Air-Conditioning Drawing									
CO Description	CO-5 Construct Refrigeration & Air conditioning drawing using a CAD Software									
LO Description	LO-11 Execute format and construction commands used in CAD software.									

SCHEME OF STUDY

S. No.	Learning Content	T-L Method	Description of T-L Process	Teach	Pract.	LRs	Remark
				Hrs.	/Tut Hrs.	Required	
	Format commands: line type, point style, units, layers, drawing limit, dimension style, text and text styles, formatting dimension style and multi leader style		Teacher will explain the contents and provide handout to students. Experimental determination of dryness fraction	2	10	Handouts, Charts, Videos, Experime ntal setup for dryness	
						fraction	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Laboratory test	. Student will be asked to Format commands: line type, point style, units, layers, drawing limit, dimension style, text and text styles, formatting dimension style and multi leader style	30	Models	External

RGPV (Diploma			Branch Code		Course Code		de	CO Code	LO Code	
Wing) Bhopal			0	1	5	5 0 4		5	12	Format No. 4
COURSE NAME	Refrigeration and Air-Conditioning Drawing	Refrigeration and Air-Conditioning Drawing								
CO Description	CO-5 Construct Refrigeration & Air conditioning draw	CO-5 Construct Refrigeration & Air conditioning drawing using a CAD Software								
LO Description	LO-12 Construction of drawing using Auto CAD.									

SCHEME OF STUDY

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Rema rk
	Application of Auto CAD: practice of Refrigeration & Air conditioning drawings using AutoCAD Presentation: Block. creating layout, insert layout. plotting printing	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	8		Handouts, Charts, Videos, models	

SCHEME OF ASSESSMENT

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	Eternal / xInternal
	Theory Test	Student will be asked to Application of Auto CAD: practice of Refrigeration & Air conditioning drawings using AutoCAD Presentation:	15	Test Paper	External