

RGPV (DIPLOMA WING) BHOPAL		OBE CURRICULUM FOR THE COURSE		FORMAT- <b>3</b>	Sheet No. 1/2
Branch	Refrigeration and Air Conditioning			Semester	IV
Course Code	401	Course Name	Advanced Air Conditioning		
<b>Course Outcome 1</b>	<b>Describe suitable indoor and outdoor design conditions based on comfort criteria.</b>			Teach Hrs	Marks
<b>Learning Outcome 1</b>	<b>State the mechanism of thermal exchange of human body with its surrounding</b>			<b>08</b>	<b>10</b>
<b>Contents</b>	Thermal Exchange Of Human Body With Environment, Physiological Hazards Resulting From Heat, Human Thermo Regulation, Different Governing Equations Of Thermal Exchanges				
<b>Method of Assessment</b>	Paper-Pen Test Prg 1(Internal)				
<b>Learning Outcome 2</b>	<b>Explain the factors affecting human comfort and need for selecting suitable inside and outside conditions.</b>			<b>08</b>	<b>10</b>
<b>Contents</b>	Environmental Factors Affecting Human Comfort , Comfort Chart, Factors Affecting Optimum Effective Temperature, Inside And Outside Summer Design Conditions Of Different Cities , Selection Of Outside And Inside Design Conditions, ASHRAE Thermal Comfort Standards 55.				
<b>Method of Assessment</b>	Theory Exam				
<b>Learning Outcome 3</b>	<b>Select the appropriate ventilations for healthy requirement</b>			04	05
<b>Content</b>	Purpose Of Ventilations, Types Of Ventilations, Fresh Air Requirements For Ventilation ,Minimum Requirements Of Ventilation, General Ventilation Requirement In A Building ,Residential Area , Hospital ,Factory Etc. Compare Natural Ventilation With Mechanical Ventilation				
<b>Method of Assessment</b>	Term Work 1 (Internal)				
<b>Course Outcome 2</b>	<b>Apply Psychometric of air conditioning system</b>			Teach Hrs	Marks
<b>Learning Outcome 4</b>	<b>Explain The Various Terms Of Psychometric Applied In Air Conditioning System</b>			<b>04</b>	<b>05</b>
<b>Content</b>	Bypass Factor, Effect Of By Pass Factor , Sensible Heat Factor, Room Sensible Heat Factors, Effective Room Sensible Heat Factor, Grand Total Sensible Heat Factor, Apparatus Dew Point,				
<b>Method of Assessment</b>	Term Work 2 (internal)				
<b>Learning Outcome 5</b>	<b>Determine The Effective Room Sensible Heat Factor , Grand Total Sensible Heat Factor For Summer Conditioning Systems</b>			<b>08</b>	<b>10</b>
<b>Content</b>	Procedure To Draw, Sensible Heat Factor , Room Sensible Heat Factors , Effective Room Sensible Heat Factor , Grand Total Sensible Heat Factor, ADP Lines On Psychrometric Chart , And Solve Simple Numerical Problem to Calculate ERSHF,GTSHF , Capacity Of Cooling Coil.				
<b>Method of Assessment</b>	Theory Exam				

<b>Course Outcome 3</b>	<b>Describe Different Air Conditioning System For Given Air Conditioning System</b>	<b>Teach hrs</b>	<b>Marks</b>
<b>Learning Outcome 6</b>	<b>Explain The Working Principle Of Evaporative Air-conditioning Systems</b>	<b>10</b>	<b>15</b>
	Introduce Evaporative Cooling Systems, Classify Evaporative Cooling Systems, Characteristics Of Direct And Indirect Multi –Stage, Evaporative Cooling Systems, Advantages And Disadvantages Of Evaporative Cooling Systems, Limitations Of Evaporative Cooling System, Applicability Of Evaporative Cooling Systems		
<b>Method of Assessment</b>	Laboratory work		
<b>Learning outcomes 7</b>	<b>Classify the various types of air conditioning systems</b>	<b>08</b>	<b>10</b>
	Comfort Air Conditioning systems , Commercial Air Conditioning systems, Industrial Air Conditioning systems, Summer, Winter, and Year Round Air Conditioning systems , All Air systems, All Water systems, Air- Water systems for Air Conditioning		
<b>Method of assessment</b>	Paper-Pen Test Prg 2 (Internal)		
<b>Learning Outcome 8</b>	<b>Explain working of Unitary and Central Air Conditioning System</b>	<b>02+08</b>	<b>10</b>
<b>Content</b>	Types Of Unitary And Central Air Conditioning Systems, Construction And Working Of Window, Split, Package Type Air Conditioners, Capacity, Application Central Air Conditioning- Types, Direct And Indirect Central Air Conditioning Construction Capacity, Application		
<b>Method of Assessment</b>	Laboratory work		
<b>Course Outcome 4</b>	<b>Describe Recent Advancement In Air Conditioning applications</b>		
<b>Learning Outcome 9</b>	<b>Explain The Working Of VRF, VRV, Beam Chiller and District System in Air Conditioning</b>	<b>08</b>	<b>10</b>
<b>Content</b>	VRF Systems, DX (Direct Expansion) System, Air Cooled System, DX Water Cooled System, VRV (Variable Refrigerant Volume) System, VRV Water Cooled System, Chilled Water System- Water Cooled, Chilled Water System-Air Cooled, Chilled Beam (radiative or convective) Cooling System, District Cooling System comparison of VRF Vs Chiller		
<b>Method of Assessment</b>	Theory Exam		
<b>Learning Outcome 10</b>	<b>Explain The Transport Air Conditioning Systems</b>	<b>2+4</b>	<b>10</b>
<b>content</b>	Air Conditioning Systems For Automobiles (Cars, Buses Etc.), Air Conditioning Systems For Trains, Air Conditioning Systems For Ships Air Conditioning		
<b>Method of Assessment</b>	Laboratory work		
<b>Learning Outcome 11</b>	<b>Apply The Current Codes and Practices in Design Of Air Conditioning Systems</b>	<b>08</b>	<b>10</b>
	Energy Simulation, ECBC Codes And Its Impact, Green Buildings, LEED Certification, Radiant Cooling Systems, Indoor Air Quality , Radiant Cooling Systems, Thermal storage Air Conditioning Systems, Clean Room Air Conditioning, Space Conditioning Air Conditioning ,		
<b>Method of Assessment</b>	Theory Exam		
<b>Course Outcome 5</b>	<b>Select Relevant Components For Given Air Distribution System And Air Handling Equipment's In Air Conditioning</b>	<b>Teach Hrs</b>	<b>Marks</b>

<b>Learning Outcome 12</b>	<b>Explain The Importance Of Air Distribution in Conditioned Space</b>	<b>08</b>	<b>10</b>
<b>Content</b>	Room Air Distribution - Types Of Supply Air Outlets - Mechanism Of Flow Through Outlets – Considerations For Selection And Location Of Outlets - Distribution Patterns Of Outlets - Grills, Diffusers - Registers - Location Of Outlets And Return Air Opening, Air Flow Pattern, Room Distributions Basics Distribution System- Closed Perimeter System, Extended Perimeter System, Construction And Application Of Supply.		
	Theory Exam		
<b>Learning Outcome 13</b>	<b>Selection Criteria for Fan Used in given Refrigeration and Air- Conditioning system</b>	2+8	15
<b>Content</b>	Introduction To Fans, Fan Characteristics, Types Of Fans, Centrifugal Fan Forward And Backward Blade Fans, Axial Flow Fan, Sound Power, Fan Capacity, Volume Flow Rate, Fan Pressure, Fan Power And Fan Efficiency, Fan Performance, The Important Operating Parameters Of A Fan Selection Of Fan For Various Applications, Motor Sizing, Noise Level, Static Pressure, Operation And Performance Issues,		
<b>Method of Assessment</b>	Laboratory work		
<b>Learning Outcome 14</b>	<b>Identify The Different Types Of Air Conditioning Ducts</b>	8	10
<b>Content</b>	Pressure Drop in Duct, Friction Loss In Duct, Duct Construction, purpose of duct, Classification of Ducts, Duct Material, Duct Shape, General Rules For Duct Design		
<b>Method of Assessment</b>	Theory Exam		
<b>Learning Outcome 15</b>	<b>Describe Different Types Of Air Distribution And Air Handling Equipment Used In Air Conditioning</b>	8	10
<b>Contents</b>	Unitary Equipment - Coil-Equipments ,Washer Equipments , Fan Coil Unit, Accessory Equipment Air Handling Unit, Air Filters, Air Locks, Air Curtains, Air Showers, Air Cleaners, Viscous Impingements Electronic Air Cleaners, Air Contaminates, Selection of Insulation, Types Of Insulation, Material And Their Properties		
<b>Method of Assessment</b>	Theory Exam		

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
					R	0	1	5	0	2	1	1	
<b>COURSE NAME</b>	Advanced Air Conditioning												
<b>CO Description</b>	CO-1 Describe suitable indoor and outdoor design conditions based on comfort criteria.												
<b>LO Description</b>	LO-1 State the mechanism of thermal exchange of human body with its surrounding.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teac h Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Thermal Exchange Of Human Body With Environment, Physiological Hazards Resulting From Heat, Human Thermo Regulation, Different Governing Equations Of Thermal Exchanges.	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	NIL						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
1	Paper-Pen Test (Prg1)	Student will be asked to State the Thermal exchange of human body with environment , different governing equations of thermal exchanges.	10	Test Paper	Internal								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME				Branch Code		Course Code		CO Code	LO Code	Format No. <b>4</b>
						R	0	1	5	0	2	
<b>COURSE NAME</b>	Advanced Air Conditioning											
<b>CO Description</b>	CO-1 Describe suitable indoor and outdoor design conditions based on comfort criteria											
<b>LO Description</b>	LO-2 Explain the factors affecting human comfort and need for selecting suitable inside and outside conditions.											
SCHEME OF STUDY												
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks					
1	Environmental Factors Affecting Human Comfort , Comfort Chart, Factors Affecting Optimum Effective Temperature, Inside And Outside Summer Design Conditions Of Different Cities , Selection Of Outside And Inside Design Conditions, ASHRAE Thermal Comfort Standards 55.	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will explain the contents and provide ASHRAE thermal comfort Standards 55. handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	08		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	Theory Exam	Student will be asked to Factors affecting human comfort , factors affecting human comfort, factors affecting optimum effective temperature , Selection of outside and Inside design conditions			10	Paper Pen	External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)												

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
					R	0	1	5	0	2	1	3	
<b>COURSE NAME</b>	Advanced Air Conditioning												
<b>CO Description</b>	CO-1 Describe suitable indoor and outdoor design conditions based on comfort criteria.												
<b>LO Description</b>	LO- 3 Select the appropriate ventilations for healthy requirement.												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching –Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remarks						
1	Purpose Of Ventilations, Types Of Ventilations, Fresh Air Requirements For Ventilation ,Minimum Requirements Of Ventilation, General Ventilation Requirement In A Building ,Residential Area , Hospital ,Factory Etc. Compare Natural Ventilation With Mechanical Ventilation	Interactive Classroom method, Handout, PPTs, Charts and Videos, Working Models of power utilization		4		Handouts, Charts, Videos, Working Models	NIL						
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment			Maximum Marks	Resources Required	External / Internal						
1	Term Work (TW1)	Student will be asked to Purpose of ventilations , types of ventilations Fresh air requirements for ventilation , minimum requirements of ventilation for health, Compare natural ventilation with mechanical ventilation			05		Internal						
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>			Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
					<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>2</i>	<i>4</i>	
<b>COURSE NAME</b>	<b>Advanced Air Conditioning</b>												
<b>CO Description</b>	<b>CO 2 : Apply Psychometry to air conditioning system</b>												
<b>LO Description</b>	<b>LO-4 : Explain The Various Terms Of Psychometry Applied to Air Conditioning Systems</b>												
<b>SCHEME OF STUDY</b>													
<b>S.No</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>	<b>Remark</b>						
1	Bypass Factor, Effect Of By Pass Factor , Sensible Heat Factor, Room Sensible Heat Factors, Effective Room Sensible Heat Factor, Grand Total Sensible Heat Factor, Apparatus Dew Point,	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	4		Handouts, Charts, Videos							
<b>SCHEME OF ASSESSMENT</b>													
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>			<b>Maximum Marks</b>	<b>Resources Required</b>	<b>External / Internal</b>						
1	TermWork 2	Students will be asked to explain Bypass factor, effect of bypass factor , Sensible Heat Factor, Room Sensible Heat Factors, Effective Room Sensible Heat Factor, Grand Total Sensible Heat Factor, Apparatus Dew Point			05		Internal						
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													

<b>RGPV (Diploma Wing ) Bhopal</b>	<b>SCHEME FOR LEARNING OUTCOME</b>			Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
				<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>2</i>	<i>5</i>	

<b>COURSE NAME</b>	<b>Advanced Air Conditioning</b>
<b>CO Description</b>	<b>CO-2 Apply Psychometry to air conditioning system</b>
<b>LO Description</b>	<b>LO-5 Determine The Effective Room Sensible Heat Factor, Grand Total Sensible Heat Factor For Air-Conditioning Systems</b>

### SCHEME OF STUDY

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
	Procedure To Draw, Sensible Heat Factor , Room Sensible Heat Factors , Effective Room Sensible Heat Factor , Grand Total Sensible Heat Factor, ADP Lines On Psychrometric Chart , And Solve Simple Numerical Problem to Calculate ERSHF,GTSHF , Capacity Of Cooling Coil.	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	08		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 Procedure to draw Sensible Heat Factor , Room Sensible Heat Factors , Effective Room Sensible Heat Factor, Grand Total Sensible Heat Factor, Apparatus Dew Point, , lines on psychrometric chart, and solve simple numerical problem for calculate ERSHF,GTSHF , Capacity of cooling coil.	10	Test Paper	External

### ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)

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RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME				Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
						R	0	1	5	0	2	3	6	
<b>COURSE NAME</b>	Advanced Air Conditioning													
<b>CO Description</b>	CO-3- Describe Different Air Conditioning Systems													
<b>LO Description</b>	LO-6 Explain The Working Principle Of Evaporative Air-conditioning Systems													
SCHEME OF STUDY														
S. No.	Learning Content				Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark				
1	Introduce Evaporative Cooling Systems, Classify Evaporative Cooling Systems, Characteristics Of Direct And Indirect Multi –Stage, Evaporative Cooling Systems, Advantages And Disadvantages Of Evaporative Cooling Systems, Limitations Of Evaporative Cooling System, Applicability Of Evaporative Cooling Systems				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	2	8	Handouts, Charts, Videos					
SCHEME OF ASSESSMENT														
S. No.	Method of Assessment	Description of Assessment					Maximum Marks	Resources Required	External / Internal					
	Laboratory work	Student will be asked to Explain evaporative cooling systems ,Classify evaporative cooling systems, advantages and disadvantages of evaporative cooling systems limitations of evaporative cooling system					15		External					
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)														

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<b>RGPV (Diploma Wing ) Bhopal</b>	<b>SCHEME FOR LEARNING OUTCOME</b>	Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
		<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>7</i>	

<b>COURSE NAME</b>	<b>Advanced Air Conditioning</b>
<b>CO Description</b>	<b>CO3- Describe Different Air Conditioning Systems</b>
<b>LO Description</b>	<b>LO- 7 Classify the various types of air conditioning systems</b>

**SCHEME OF STUDY**

S. No	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
	Comfort Air Conditioning systems , Commercial Air Conditioning systems, Industrial Air Conditioning systems, Summer, Winter, and Year Round Air Conditioning systems , All Air systems, All Water systems, Air- Water systems for Air Conditioning	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	08		Handouts, Charts, Videos	

**SCHEME OF ASSESSMENT**

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Paper pen test(Prg2)	Student will be asked to Classify the different air conditioning systems Comfort Air Conditioning , Commercial Air Conditioning, Industrial Air Conditioning, Summer, Winter, and Year Round Air Conditioning , All Air systems, All Water systems, Air- Water systems for Air Conditioning	10	Test Paper	Internal

**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)**

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<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>			Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
					<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>3</i>	<i>8</i>	
<b>COURSE NAME</b>	<b>Advanced Air Conditioning</b>												
<b>CO Description</b>	<b>CO3 Describe Different Air Conditioning Systems</b>												
<b>LO Description</b>	<b>LO-8 Explain working of Unitary and Central Air Conditioning System</b>												
<b>SCHEME OF STUDY</b>													
<b>S. No.</b>	<b>Learning Content</b>	<b>T-L Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>	<b>Rem ark</b>						
	Types Of Unitary And Central Air Conditioning Systems, Construction And Working Of Window, Split, Package Type Air Conditioners, Capacity, Application Central Air Conditioning- Types, Direct And Indirect Central Air Conditioning Construction Capacity, Application	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	2	8	Handouts, Charts, Videos, Experimental setup for dryness fraction							
<b>SCHEME OF ASSESSMENT</b>													
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>			<b>Maximum Marks</b>	<b>Resources Required</b>	<b>External / Internal</b>						
	Laboratory work	Student will be asked to Types of Unitary and Central air conditioning system ,Construction and working of window, split, package type air conditioners, direct and indirect central air conditioning construction ,capacity, application			10	Test Paper	Internal						
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
					R	0	1	5	0	2	4	9	
<b>COURSE NAME</b>	Advanced Air Conditioning												
<b>CO Description</b>	CO- 4 Describe Recent Advancement In Air Conditioning applications												
<b>LO Description</b>	LO-9 Explain The Working Of VRF, VRV, Beam Chiller and District System in Air Conditioning												
SCHEME OF STUDY													
S. No.	Learning Content	T-L Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark						
	VRF Systems, DX (Direct Expansion) System, Air Cooled System, DX Water Cooled System, VRV (Variable Refrigerant Volume) System, VRV Water Cooled System, Chilled Water System- Water Cooled, Chilled Water System- Air Cooled, Chilled Beam (radiative or convective) Cooling System, District Cooling System comparison of VRF Vs Chiller	Interactive Classroom method, Handout, PPTs, Charts and Videos.	Teacher will explain the contents and provide handout to students. Experimental determination of entropy	08		Handouts, Charts, Videos, Experimental setup for							
SCHEME OF ASSESSMENT													
S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal								
	Theory Exam	Student will be asked to Explain the working of of VRF Systems and Chilled Water System ,Chilled Beam Cooling System, District Cooling System comparison of VRF Vs Chiller	10		External								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

RGPV (Diploma Wing ) Bhopal		SCHEME FOR LEARNING OUTCOME			Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
					R	0	1	5	0	2	4	10	
<b>COURSE NAME</b>	Advanced Air Conditioning												
<b>CO Description</b>	CO-4 Describe Recent Advancement In Air Conditioning applications												
<b>LO Description</b>	LO- 10 Explain The Transport Air Conditioning Systems												
SCHEME OF STUDY													
S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark						
	Air Conditioning Systems For Automobiles (Cars, Buses Etc.), Air Conditioning Systems For Trains, Air Conditioning Systems For Ships Air Conditioning	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	2	04	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								
	Laboratory work	Student will be asked to Explain Air conditioning systems used in automobiles (cars, buses etc.) and transportation sectors .	10	Test Paper	Internal								
ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)													

<b>RGPV (Diploma Wing ) Bhopal</b>								<b>SCHEME FOR LEARNING OUTCOME</b>								Branch Code			Course Code			CO Code	LO Code	Format No.					
								<i>R</i>			<i>0</i>			<i>1</i>			<i>5</i>			<i>0</i>			<i>2</i>			<i>4</i>	<i>11</i>	<b>4</b>	
<b>COURSE NAME</b>								<b>Advanced Air Conditioning</b>																					
<b>CO Description</b>								<b>CO-4 Describe Recent Advancement In Air Conditioning applications</b>																					
<b>LO Description</b>								<b>LO-11 Apply The Current Codes and Practices in Design Of Air Conditioning Systems</b>																					
<b>SCHEME OF STUDY</b>																													
<b>S. No.</b>		<b>Learning Content</b>						<b>T-L Method</b>			<b>Description of T-L Process</b>						<b>Teach Hrs.</b>		<b>Pract. /Tut Hrs.</b>		<b>LRs Required</b>		<b>Remark</b>						
		Energy Simulation, ECBC Codes And Its Impact, Green Buildings, LEED Certification, Radiant Cooling Systems, Indoor Air Quality , Radiant Cooling Systems, Thermal storage Air Conditioning Systems, Clean Room Air Conditioning, Space Conditioning Air Conditioning ,						Interactive Classroom method, Handout PPTs, Charts and Videos, Models			Teacher will explain the contents and providehandout to students. Experimental determination of dryness fraction						08				Handouts, Charts, Videos, Experime ntal setup for dryness fraction								
<b>SCHEME OF ASSESSMENT</b>																													
<b>S. No.</b>		<b>Method of Assessment</b>				<b>Description of Assessment</b>						<b>Maximum Marks</b>				<b>Resources Required</b>				<b>External / Internal</b>									
		Theory Exam				Student will be asked to describe ECBC Codes, green building codes , Indoore Air Quality , Radiant Cooling Systems. Thermal storage Air Conditioning Systems Clean Room Air Conditioning,						10				ECBC Guidelines and BEE standards				External									
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>																													

<b>RGPV (Diploma Wing ) Bhopal</b>										
<b>SCHEME FOR LEARNING OUTCOME</b>		Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
		<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>12</i>	
<b>COURSE NAME</b>		<b>Advanced Air Conditioning</b>								
<b>CO Description</b>		<b>CO- 5 Select Relevant Components For Given Air Distribution System And Air Handling Equipment's In Air Conditioning</b>								
<b>LO Description</b>		<b>LO- 12 Explain The Importance Of Air Distribution in Conditioned Space</b>								
<b>SCHEME OF STUDY</b>										
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching – Learning Method</b>	<b>Description of T-L Process</b>			<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>	<b>Remark</b>	
	Room Air Distribution - Types Of Supply Air Outlets - Mechanism Of Flow Through Outlets – Considerations For Selection And Location Of Outlets - Distribution Patterns Of Outlets - Grills, Diffusers - Registers - Location Of Outlets And Return Air Opening, Air Flow Pattern, Room Distributions Basics Distribution System- Closed Perimeter System, Extended Perimeter System, Construction And Application Of Supply.	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		
<b>SCHEME OF ASSESSMENT</b>										
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>			<b>Maximum Marks</b>		<b>Resources Required</b>	<b>External / Internal</b>		
	Theory exam	Student will be asked to Explain Room air distribution - types of supply air outlets - Mechanism of flow through outlets – Considerations for selection and location of outlets - Distribution patterns of outlets - grills, diffusers - registers - location of outlets and return air opening patterns of outlets - grills, diffusers - registers - location of outlets and return air opening			10		Test Paper	External		

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**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)**

<b>RGPV (Diploma Wing ) Bhopal</b>	<b>SCHEME FOR LEARNING OUTCOME</b>	Branch Code			Course Code			CO Code	LO Code	Format No. <b>4</b>
		<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>5</i>	<i>13</i>	

<b>COURSE NAME</b>	<b>Advanced Air Conditioning</b>
<b>CO Description</b>	<b>CO- 5 Select Relevant Components For Given Air Distribution System And Air Handling Equipment's In Air Conditioning</b>
<b>LO Description</b>	<b>LO-13 Selection Criteria for Fan Used in given Refrigeration and Air- Conditioning system</b>

**SCHEME OF STUDY**

S. No.	Learning Content	Teaching – Learning Method	Description of T-L Process	Teach Hrs.	Pract. /Tut Hrs.	LRs Required	Remark
1	Introduction To Fans, Fan Characteristics, Types Of Fans, Centrifugal Fan Forward And Backward Blade Fans, Axial Flow Fan, Sound Power, Fan Capacity, Volume Flow Rate, Fan Pressure, Fan Power And Fan Efficiency, Fan Performance, The Important Operating Parameters Of A Fan Selection Of Fan For Various Applications, Motor Sizing, Noise Level, Static Pressure, Operation And Performance Issues,	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	2	8	Handouts, Charts, Videos, models	

**SCHEME OF ASSESSMENT**

S. No.	Method of Assessment	Description of Assessment	Maximum Marks	Resources Required	External / Internal
	Laboratory Work	. Students will be asked to working of different types of fan used in air Conditioning system, Fan sound power , fan capacity volume flow rate, fan pressure, Fan Power and Fan Efficiency, Fan Performance, The important operating parameters of a fan Selection of fan for various applications	15	Test Paper	External

**ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)**

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<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>			Branch Code		Course Code		CO Code	LO Code	Format No. <b>4</b>
					<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	
<b>COURSE NAME</b>	<b>Advanced Air Conditioning</b>										
<b>CO Description</b>	<b>CO-5 Select Relevant Components For Given Air Distribution System And Air Handling Equipment's In Air Conditioning</b>										
<b>LO Description</b>	<b>LO-14 Identify The Different Types Of Air Conditioning Ducts</b>										
<b>SCHEME OF STUDY</b>											
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>	<b>Remark</b>				
	Pressure Drop in Duct, Friction Loss In Duct, Duct Construction, purpose of duct, Classification of Ducts, Duct Material, Duct Shape, General Rules For Duct Design	Interactive Classroom method, Handout, PPTs, Charts and Videos, Models	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 of Impulse and Reaction Turbine					
<b>SCHEME OF ASSESSMENT</b>											
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>	<b>External / Internal</b>						
	Theory Exam	Student will be asked to use of duct ,Classification of Ducts ,Duct Material , Duct Shape, General Rules for duct design	10		External						
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>											

<b>RGPV (Diploma Wing ) Bhopal</b>		<b>SCHEME FOR LEARNING OUTCOME</b>			Branch Code		Course Code			CO Code	LO Code	Format No. <b>4</b>
					<i>R</i>	<i>0</i>	<i>1</i>	<i>5</i>	<i>0</i>	<i>2</i>	<i>5</i>	
<b>COURSE NAME</b>	<b>Advanced Air Conditioning</b>											
<b>CO Description</b>	<b>CO-5 Select relevant components for given air distribution system and Air handling equipment's in air conditioning</b>											
<b>LO Description</b>	<b>LO-15 Describe Different Types Of Air Distribution And Air Handling Equipment Used In Air Conditioning</b>											
<b>SCHEME OF STUDY</b>												
<b>S. No.</b>	<b>Learning Content</b>	<b>Teaching –Learning Method</b>	<b>Description of T-L Process</b>	<b>Teach Hrs.</b>	<b>Pract. /Tut Hrs.</b>	<b>LRs Required</b>	<b>Remark</b>					
	Unitary Equipment - Coil-Equipments ,Washer Equipments , Fan Coil Unit, Accessory Equipment Air Handling Unit, Air Filters, Air Locks, Air Curtains, Air Showers, Air Cleaners, Viscous Impingements Electronic Air Cleaners, Air Contaminates, Selection of Insulation, Types Of Insulation, Material And Their Properties	Interactive Classroom method, Handout, PPTs, Charts and Videos, Models	Teacher will explain the contents and provide handout to students. Teacher will conduct Quiz/visit to make students practice their knowledge	08		Handouts, Charts, Videos, models of Impulse and Reaction Turbine						
<b>SCHEME OF ASSESSMENT</b>												
<b>S. No.</b>	<b>Method of Assessment</b>	<b>Description of Assessment</b>	<b>Maximum Marks</b>	<b>Resources Required</b>	<b>External / Internal</b>							
	Theory Exam	Student will be asked to Describe different types of air distribution and air handling equipment used in air conditioning. Fan Coil Unit , accessory equipment Air Handling Unit ,air filters ,air locks ,air curtains, air showers Air cleaners, viscous impingements, electronic air cleaners ,air contaminates selection of Insulation, purpose, types of insulation material and their properties.	10		External							
<b>ADDITIONAL INSTRUCTIONS FOR THE HOD/ FACULTY (IF ANY)</b>												

