

Khulna Polytechnic Institute
Refrigeration & Air Conditioning Technology
Semester Plan

Subject Name: Commercial & Industrial RAC

Subject Code -27252

Semester: 5th

Teacher Name: Emdadul Haque Khan, Instructor (RAC)

Week	Type of Class	Content	Remarks
1 st	Theory	1. WATER DISPENSING UNIT & DISPLAY CASE 1.1 Define water dispensing unit & display case. 1.2 State the water dispensing unit & display case. 1.3 Illustrate the classification of water cooler & display case.	
	Theory	1.4 Explain construction and operation of bottle water cooler & display case. 1.5 Mention the advantages and disadvantages of water dispensing unit.	
	Practical	1. Test the performance of a water cooler .1 Wear personal protective equipment-PPE 1.2 Follow the occupational health and safety-OSH 1.3 Put the bottle of water on the water cooler. 1.4 Start the water cooler and measure the starting current. 1.5 Observe running current and noise level, 1.6 Measure the water temperature after 30 minutes. 1.7 Observe automatic operation. 1.8 Maintain the record of performed task	
2 nd	Theory	2. BEVERAGE, WALK & REACH IN COOLER 2.1 Define beverage cooler, walk in cooler & reach in cooler. 2.2 Explain beverage cooler, walk in cooler & reach in cooler. 2.3 State the construction of beverage cooler, walk in cooler & reach in cooler.	
	Theory	2.4 Describe the operation of beverage cooler, walk in cooler & reach in cooler. 2.5 Explain the air distribution cycle of beverage cooler, walk in cooler & reach in cooler.	

	Practical	2.Test the performance of a display freezer 2.1 Collect and observe the specification of display freezer. 22 Compare voltage, current and watt of the display freezer 23 Measure inside temperature of the freezer. 2.4 Compare the calculated capacity and the capacity of mentioned in the specification. 2.5 Determine the performance.	
	Theory	3. MILK & FISH PROCESSING PLANT 3.1 State the milk & fish processing plant. 3.2 Explain the refrigeration cycle process flow diagram of milk & fish processing plant 3.3 Describe the preparation process of powder and condensed milk.	
	Theory	1.4 Explain preservation process of powder, condensed milk & fish. 3.5 Describe the marketing strategy of powder, condensed milk & fish.	
3 rd	Practical	5.Observe the operation of a fish processing plant 5.1 Identify the name, address and date of visit of the fish processing plant 5.2 Identify an amount of fish store in the plant. 5.3 Identify the type of compressor, condenser, receiver, expansion device and evaporator with number of each component 5.4 Identify the loading and unloading method of the fish. 5.5 Identify the loading and unloading of the compressor. 5.6 Draw the interconnection between compressors discharge lines, suction lines, liquid lines, and evaporators 5.7 Identify the compressor oil charging and recovery method. 5.8 Observe the starting and stopping method of the compressor. 5.9 Identify the voltage, ampere, kw and type of compressor motor connection. 5.10 Prepare a technical report.	

4 th	Theory	Quiz-01 4. ICE PLANT 4.1 State the ice making plant. 4.2 Mention the classification of ice plant.	
	Theory	4.3 Illustrate the operation procedure of ice plant with flow diagram 4.4 List the raw materials to make commercial ice cream. 4.5 Describe the preparation process of commercial ice cream,	
	Practical	3. Perform the operation of the ice-cream plant 3.1 Observe the ice cream plant. 3.2 Check the size of the ice cream with number of candy ice cream produced per day. 3.3 Check the ice cream preparation process. 3.4 Check the amount/ratio of materials used per piece/kg of ice cream. 3.5 Identify the mentioned refrigeration capacity of the plant. 3.6 Identify the type of compressor, condenser, receiver, expansion device, evaporator of refrigeration cycle. 3.7 Identify the starting and stopping method of refrigeration plant. 3.8 Identify the starting procedure of the produced ice cream. 3.9 Make an organogram of the ice cream factory. 3.10 Identify the recovery method of refrigerant. 3.11 Prepare a technical report.	
5 th	Theory	4.6 Explain the brine preparation used in a commercial ice plant. 4.7 Describe the loading of water and unloading of ice in an ice plant. 4.8 Describe the storing & marketing strategy of ice.	
	Theory	5. COLD STORAGE PLANT 5.1 State cold storage plant. 5.2 Mention the classification of cold storage plant. 5.3 Describe the construction process of cold storage plant. 5.4 Describe the humidity control process of cold storage.	

	Practical	4. Observe the operation of a cold storage 4.1 Identify the name, address and date of visit of the cold storage. 4.2 Identify the product and amount of product stored in the plant. 4.3 Identify the type of compressor, condenser, receiver, expansion device and evaporator with number of each component. 4.4 Identify the loading and unloading method of the product. 4.5 identify the loading and unloading of the compressor. 4.6 Draw the interconnection between compressors, discharge lines, suction lines, liquid lines and evaporators. 4.7 Identify the compressor oil charging and recovery method. 4.8 Observe the starting and stopping method of the compressor. 4.9 Identify the voltage, ampere, kw and type of compressor motor connection. 4.10 Prepare a technical report.	
6 th	Theory	5.5 Describe the preservation process of potato, vegetable & fruits in cold storage. 5.6 Describe defrosting process of cold storage evaporator purging of cold storage refrigeration system.	
	Theory	5.8 Draw the layout plan of a cold storage. 5.9 Describe different components of low-pressure refrigerant re-circulation (pump vessel) unit.	
	Practical	8. Operate window type air conditioner 8.1 Identify the components of refrigerant cycle of window type air conditioner. 8.2 Identify the electrical components of window type air-conditioner. 8.3 Install window type air conditioner. 8.4 Operate the window type air conditioner and check the performance. 8.5 Draw the electrical circuit of window type air conditioner.	

7 th	Theory	Class Test-01	
	Theory	6. VENDING MACHINE & INCUBATOR 6.1 Explain vending machine & incubator. 6.2 Describe the operation of vending machine. 6.3 Describe food & snack, bulk candy, beverage vending machine with flow diagram.	
	Practical	9. Operate split type air conditioner 9.1 Identify outdoor unit, indoor unit, refrigerant piping and electrical cables. 9.2 Observe the operating button and operation of the remote 9.3 Observe the operator of the split type air conditioner. 9.4 Install split type air conditioner. 9.5 Operate split type air conditioner. 9.6 Check the performance of the air conditioner.	
8 th	Theory	6.4 Describe the function of incubator. 6.5 Describe the operation & controlling of egg incubator. 6.6 Mention the safety precaution of incubator	
	Theory	Review Class	
	Practical	Mid Semester	
9 th	Theory	Mid Semester	
	Theory	Mid Semester	
	Practical	Mid Semester	
10 th	Theory	7. CENTRAL AIR CONDITIONING SYSTEMS 7.1 State central air conditioning plant. 7.2 Outline the classification of central air conditioning plants. 7.3 State the meaning of DX & IDX system.	
	Theory	7.4 State the function of each component of DX & IDX system used in air conditioning plant. 7.5 Outline the advantage and disadvantages of IDX system over DX system. 7.6 Differentiate between DX and IDX system central air conditioning plant.	

	Practical	6. Observe the working principle of chiller type centrifugal central air conditioning plant 6.1 Draw the refrigeration cycle of centrifugal water chiller using standard symbol. 6.2 Identify major component of a central air conditioning plant which use centrifugal compressor. 6.3 Record the plant capacity, number of compressors, condenser. expansion device, evaporator with capacity. 6.4 Record the operating pressure of compressor and oil pump. 6.5 Draw the water cycle of centrifugal water chiller of central air conditioning plant. 6.6 Prepare a technical report.	
11 th	Theory	8. ABSORPTION TYPE CENTRAL AIR CONDITIONING PLANT 8.1 List the components of lithium bromide & water type central air conditioning plant. 8.2 State the function of each component of lithium bromide and water type absorption system.	
	Theory	8.3 Illustrate the lithium bromide and water type absorption system. 8.4 State the advantages and disadvantages of lithium bromide & water type absorption system over centrifugal water chiller for central air conditioning plant.	
	Practical	7. Observe the principle of absorption type central air conditioning plant 7.1 Identify major component of an absorption type central air conditioning plant. 7.2 Record all the variables of the plant. 7.3 Calculate the plant capacity and compare with the mechanical system. 7.4 Prepare report of the plant visited.	
12 th	Theory	Class Test-02	
	Theory	9. COMMERCIAL AIR CONDITIONING PLANT 9.1 State the considering factors to select air conditioning plant for an international hotel	

		9.2 State the purposes of central air conditioning plant in commercial super market. 9.3 Describe air-cooling system of hall/ball room of a hotel & super market with diagram.	
	Practical	8. Operate window type air conditioner 8.1 Identify the components of refrigerant cycle of window type air conditioner. 8.2 Identify the electrical components of window type air-conditioner. 8.3 Install window type air conditioner. 8.4 Operate the window type air conditioner and check the performance. 8.5 Draw the electrical circuit of window type air conditioner.	
	Theory	9.4 State the different types of chillers 9.5 Illustrate chilled water piping system of an international hotel & super market with diagram. 9.6 Describe condensate drainage system of an air conditioning plant of a hotel & super market with diagram.	
13 th	Theory	10. INDUSTRIAL AIR CONDITIONING PLANT 10.1 State the purposes of air conditioning in industry. 10.2 Describe the humidification method in industrial air conditioning plant. 10.3 Explain the dehumidification method used in industry.	
	Practical	9. Operate split type air conditioner 9.1 Identify outdoor unit, indoor unit, refrigerant piping and electrical cables. 9.2 Observe the operating button and operation of the remote 9.3 Observe the operator of the split type air conditioner. 9.4 Install split type air conditioner. 9.5 Operate split type air conditioner. 9.6 Check the performance of the air conditioner.	
14 th	Theory	Quiz-02	
	Theory	10.4 Illustrate the hot air removal from the textile mill/garments industry.	

		10.5 Describe the window, split, cassette & package type Air- conditioner,	
	Practical	10. Measure sound level of different components of air conditioning plant and compare with the acceptable level of noise 10.1 Measure the sound level of compressor motor set. 10.2 Measure the sound level of pump motor set 10.3 Measure the sound level of cooling tower 10.4 Measure the sound level of AHU 10.5 Maintain the record of performed task	
15 th	Theory	11. ACOUSTICS AND CONTROL OF NOISES 11.1 State acoustics 11.2 List sound absorption material 11.3 Describe the principles of noise attenuation in pipes and ducts of air conditioning systems.	
	Theory	11.4 State the promising practices of noise attenuation in pipes and ducts of air conditioning system in Bangladesh. 11.5 Describe the methods to reduce the noise by the AHU, FCU. compressor and pump motor set.	
	Practical	Model Test-01	
16 th	Theory	Review Class	
	Theory	Review Class	
	Practical	Review Class	