Subject Number: ME\ 763 Subject: Air Conditioning and Refrigeration		رمز الموضوع: همك /763 الموضوع: تكييف وتجميد	
		ع. سيت رسيت	الموسور
_		5.	المحداث
Units:5		لوحدات:5 لساعات الأسبوعية :نظري :2	
Weekly Hours: Theoretical:2		7	اساحات
	Experimental:1	عملي : 1	
	Tutorial:1	مناقشة : 1	1 .
Week	Contents	المحتويات	الأسبوع
	Review of basic principle	مراجعة للمبادئ الإساسية	
1	- To review all thermodynamic and fluid	- مراجعه عامه للعلاقات الثرموديناميكيه	1
	flow relations corresponding to the air	والجريانيه ذات العلاقه بموضوع تكييف الهواء	
	conditioning subject.	والتبريد	
	Properties of air and water vapor	خواص الهواء وبخار الماء	
	mixture		
2	- To outline the mixing processes of gases	- تحديد العلاقات الخاصه بعمليات الخلط وخاصة	2
	especially dry air and water vapor to	بين الهواء الجاف وبخار الماء التي نحتاجها في	
	obtain the moist air required in air	تطبيقات تكييف الهواء	
	conditioning practice	**	
	Psychometric Processes	الاجراءات المصردية	_
3	- To learn the construction of the	- نتعلم رسم المخطط المصردي وجميع العمليات	3
	Psychometric chart and the related	المصرديه ذات العلاقه بالهواء الرطب	
	psychometric processes of moist air	اجراءات التبريد والتدفئة والترطيب وازالة	
	Cooling Heating , humidification & dehumidification, processes	الجراءات العبريد والعدققة والعرطيب وارائته	
4	- To perform the processes of cooling,	مرتعوبه . - رسم اجراءات التبريد و التدفئة والترطيب	4
7	heating, humidification and	و از اله الرطوبة وحساب كميات الحرارة والكتلة	•
	dehumidification on the psychometric	المتعلقة بكل منها	
	chart and calculating the related heat and	, .	
	mass transfer quantities.		
	Practical air conditioning process /	دورات التكييف العملية / صيف	
	summer		
5	- Studying the practical summer	- دراسة التطبيقات المصرديه الصيفية كعملية	5
	psychrometric applications such as	خلط الهواء وتبريده وترطيبه وازالة رطوبته	
	mixing, cooling, dehumidifying using	باستخدام هواء خارجي فقط او هواء راجع فقط	
	all outside air ,all return air or any other	او خلیط من کلیهما	
	combination practice	د رفسه ۱۹ ۹ ۲ د و دو	
	Practical air conditioning process /	دورات التكييف العملية / شتاء	
6	winter - Similar practice for winter season as in	- تطبيقات شتويه مشابهه كما هي الحال في	6
U	summer practice	- تطبيعات سنويد المسابهة عما هي الحال في تطبيعات فصل الصيف	0
	Thermal comfort &design conditions	الراحة الحرارية والظروف التصميمية	
7	- To specify the related comfort design	. مراكب العراقية والمتعلقة بالراحة البشرية - إيضاح العلاقات المتعلقة بالراحة البشرية	7
,	conditions based on ASHRAE standard	وظروفها التصميمية وفق المقاسات العالمية	,
	with the effective temperature for air	لجمعية اشري باستخدام فكرة درجة الحرارة	
	conditioned spaces	الفعالة في المباني المكيفة	

### 10 carry out the calculation required for load estimation starting with wall and roof resistances and the related CLTD and CLTD corrections. Cooling load calculation / windows		Cooling load calculation /wall &roofs	حسابات حمل التبريد / للجدران والسقوف	
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Equal pressure drop method 17 - Solving several practical exercises to learn the use of equal pressure drop method in designing ducting systems 17 18 Pressure distribution diagram & the use 19 Acade Horms 10 Pressure distribution diagram & the use			على طريقة هبوط الضغط المنساوي لسهولتها	
- Solving several practical exercises to learn the use of equal pressure drop method in designing ducting systems Pressure distribution diagram & the use			ما يقة هدما الشاشا المتالية	
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method in designing ducting systems Pressure distribution diagram & the use	1/	= =		1/
Pressure distribution diagram & the use		* * *	,	
8				
		of ductulater		
18 - Carry out pressure calculation to plot the اجراء الحسابات ألازمه لرسم مخطط توزيع	18		- اجراء الحسابات ألازمه لرسم مخطط توزيع	18
pressure distribution along the ducting الضغط على امتداد منظومة مجاري الهواء وتعلم				

	gustam and learning the use of ductulator	استخدام الداكتليتر في مواقع العمل	
	system and learning the use of ductulater for site applications	استخدام الداخلييار في مواقع العمل	
	Fan ; types & laws	المراوح وانواعها وقوانينها	
19	- To study fans, its types and laws for air	- دراسة المراوح المستخدمة في تطبيقات تكييف	19
	conditioning applications	الهواء وانواعها والقوانين الحاكمة لها	
	Piping Design application	تصميم الانابيب	
20	- Explain the importance of piping design	- توضيح اهمية تعلم تصميم الانابيب وحل	20
	and solve related example to lear such	مجموعه من التمارين ذات العلاقة بالتطبيقات	
	design as found in air conditioning	الموجوده في تكبيف الهواء كما هو الحال في	
	practice as in central A/C stations	المنظومات المركزية	
	Pumps ; Types & Selection	المضخات/ انواعها وطريقة الأختيار	
21	- Highlight the types for centrifugal	- شرح انواع المضخات التنابذيه وكيفية اختيارها	21
	pumps and their selections according to	و فق السعات و الضغوط المطلوبه	
	head and capacities required		
	Refrigerant properties	خواص موائع التجميد	
22	- Properties of refrigerants such boiling	- در اسة خواص وسائط التبريد كدرجة حرارة	22
	point, saturated temperature, ,latent heat	الغليان ودرجة حرارة الاشباع والحراره الكامنه	
	critical point, specific volume, and their	والنقطه الحرجه والحجم النوعي وتاثيراتها على	
	effects on selecting the required	اختيار وسيط التبريد المطلوب	
	refrigerant	. 3	
	Refrigeration machine & Carnot cycle	الماكنة التجميديه ودورة كارنوت	
23	- Highlight the differences between the	- بيان الاختلاف بين الماكنه الحرارية والماكنه	23
	heat engine and the refrigeration	التثليجيه وفق قانوني ديناميك الحراره الاول	
	machine according to the first and second	والثاني وحسب دورة كارنو	
	laws of thermodynamics in relation to the	33 33 . 32 3	
	Carnot cycle		
	Refrigeration systems	منظومات التجميد	
24	- Study the type of refrigeration systems	- دراسة انواع منظومات التجميد كمنظومة	24
	such as VCRS, ARS and air cycle	انضغاط البخار والمنظومه الامتصاصيه	
	refrigeration system and the application	والمنظومه الهوائيه والتطبيقات والتحديدات لكل	
	and limitations of each one	منها	
	Saturated vapor compression cycle	دورة التجميد الانظغاطية الاشباعية	
25	- Define the VCRC and its P-H Moeller	- التعرف على منظومة انضغاط البخار	25
	Chart and diagram and how to find the	التجميديه الاشباعيه ورسمها على مخطط مولير	
	related enthalpies from the given	لايجاد المحتويات الحراريه عند درجات الحراره	
	temperatures and pressures	والضغوط المعطات	
		7 0 0 1 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
•	Actual vapor compression cycle	دورة التجميد الانضغاطية الحقيقية	2.
26	- Specify the differences between the	- توضيح الفروقات بين دورة انضغاط البخار	26
	actual and the ideal cycles and the effect	الحقيقيه ودورة انضغاط البخار النظريه وتاثير	
	of friction and heat transfer losses on	خسائر الاحتكاك وانتقال الحراره في ذلك	
	both of them	T t as het a settler	
2=	Absorption refrigeration cycle	دورة التجميد الامتصاصية	2-
27	- To study the absorption refrigeration	- در اسة دورة التجميد الامتصاصيه كدوره مفيده	27
	cycle as an energy conservation cycle	في ترشيد استهلاك الطاقه حيث انها لاتحتوي	
	that required no compressor or some time	على ضاغط ميكانيكي او في بعض الحالات اي	
	no moving parts in it	جزء متحرك	

Air Conditioning and Refrigeration Engineering\ Third year stage فرع التكييف والتجميد/مرحلة الصف الثالث

28	Absorption system / mass and heat balance - Carry out the mass and energy balances	منظومة التجميد الامتصاصيه / موازنة الكتلة والحرارة - اجراء الموازنات الكتليه والحراريه اللازمه في	28
	of the ARC and to check its	منظومة اتجميد الامتصاصيه وتحقيق الموازنه	
	thermodynamic balance with solving examples	الثر موديناميكيه بمساعدة حل الامثله والتمارين التطبيقيه	
	Air – refrigeration cycle	دورة تجميد بالهواء	
29	- To explore the importance of air	- ايضاح اهمية منظومة التجميد الهوائيه في	29
	refrigeration cycle in now day use and its	استخدامات الوقت الحاضر والتعرف على	
	thermodynamic principles	المبادئ الثرموديناميكيه لها	
	Air – refrigeration cycle / application	تطبيقات على دورة التجميد بالهواء	
30	- To solve a related examples and	- حل مجموعه من التمارين والتطبيقات على	30
	applications for the air refrigeration cycle	استخدام دورة التجميد الهوائيه وخاصة تلك	
	specially as it used in air crafts	المستخدمه في الطائر ات	