

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Maintenance of Refrigeration & Air Conditioning Systems		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOMU02011062		
ECTS Credits	8		
SWL (hr/sem)	200		
Module Level	1	Semester of Delivery	
Administering Department	PM	College	TE
Module Leader	Muhsin Olaiwi Nassir	e-mail	Muhsin.Olaiwi@uomus.edu.iq
Module Leader's Acad. Title	.subject Lecturer	Module Leader's Qualification	M.Sc.
Module Tutor	Name (if available)	e-mail	
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	
Co-requisites module	None	Semester	

Module Aims, Learning Outcomes and Indicative Contents	
أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Objectives	

<p>أهداف المادة الدراسية</p>	<ol style="list-style-type: none"> 1. The student recognizes the necessary experience to operate. 2. The student recognizes the necessary experience to operate maintenance of Heating Ventilating) 3. The student recognizes the necessary experience to operate Air Conditioning equipment. 4. The student recognizes the necessary experience from theoretical and practical lectures
<p>Module Learning Outcomes</p> <p>مخرجات التعلم للمادة الدراسية</p>	<ol style="list-style-type: none"> 1. Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. 2. Knowledge of all public and public safety laws, regulations, legislation, and rules. 3. The ability to know and use refrigeration and air conditioning tools and equipment in the correct and safe manner. 4. The ability to solve problems related to refrigeration and air conditioning systems 5. Full understanding of refrigeration and air conditioning systems, and the ability to install, maintain, and repair them.
<p>Indicative Contents</p> <p>المحتويات الإرشادية</p>	<p>Indicative content includes the following.</p> <p><u>Part A -</u> Introduction to tool, material and instrument, external maintenance and charging domestic refrigerator, electrical circuit of window air condition, maintenance Automobile air conditioning, Split units. [15hrs] Maintenance of fans, inspection of fan-coil unit, Maintenance of reciprocating cooling water equipment, Maintenance of centrifugal cooling water equipment , Maintenance of the tower packages [15 hrs] Maintenance of water pumps Maintenance of the boiler, Maintenance of air washer units [10 hrs] Practical visitation to workshop of domestic cooling equipment. [6hrs]</p> <p><u>Part B –</u> Fundamentals . To understand inspection of the electrical components,, cleaning of the tower, Maintenance of mixing boxes [15 hrs]</p> <p>Remote Split units, inspection, operation, maintenance, Different inspections on electrical circuit for automobile air conditioning equipment, Replacing the components of window air-conditioner [7 hrs]</p> <p>maintenance of electrical circuits, installing with domestic equipment, evacuating and charging [15 hrs]</p>

Learning and Teaching Strategies

استراتيجيات التعلم والتعليم

Strategies	Type something like: The major approach used to offer this module will be to promote student engagement in the exercises while also enhancing and broadening their critical thinking abilities. This will be accomplished through lectures, interactive tutorials, and the consideration of various sorts of easy experiments incorporating some engaging sampling exercises for the students.
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Student Workload (SWL)

الحمل الدراسي للطلاب محسوب لـ ١٥ أسبوعا

Structured SWL (h/sem) الحمل الدراسي المنتظم للطلاب خلال الفصل	78	Structured SWL (h/w) الحمل الدراسي المنتظم للطلاب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطلاب خلال الفصل	122	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطلاب أسبوعيا	8
Total SWL (h/sem) الحمل الدراسي الكلي للطلاب خلال الفصل	200		

Module Evaluation

تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3 and 12	LO #1, #2 and #10, #11
	Assignments	-	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	3	20% (20)	Continuous	All
	Report				
Summative assessment	Midterm Exam	3hr	10% (10)	7	LO #1 - #7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Tools, materials and instruments employed for inspection and measurement
Week 2	Maintenance of domestic refrigerator
Week 3	Water cooler, electrical and mechanical circuits, maintenance of electrical circuits, installing with domestic equipment.

Week 4	Windows air-conditioner, mechanical components, maintenance of electrical circuit.
Week 5	Automobile air conditioning equipment, cleaning and maintenance
Week 6	Split units (single phase and three phases), mechanical components, maintenance and replacing mechanical components
Week 7	Maintenance of fans, fan motors and heating and cooling coils, filters and maintenance of air handling equipment
Week 8	Maintenance of reciprocating cooling water equipment that used reciprocating for air conditioning purposes.
Week 9	Maintenance of absorption refrigeration equipment.
Week 10	Inspection of electrical circuit, cleaning of contact points for conductors, inspection and regulation of controls.
Week 11	Maintenance of the tower packages, replacing the circulation packages, replacing belts, justice belts and cleaning the water
Week 12	Maintenance of water pumps, disassembly of pump and maintenance of internal components, maintenance of electrical motor.
Week 13	Maintenance all parts of central air conditioning equipment (starter, cleaning of shields, increasing the current for each motor).
Week 14	Maintenance of air washer units and evaporative cooling units
Week 15	Practical visitation to workshop of domestic cooling equipment.

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Maintenance of domestic refrigerator
Week 2	Maintenance of Windows air-conditioner
Week 3	Maintenance of Automobile air conditioning equipment
Week 4	Maintenance of fans
Week 5	Maintenance of the cooling tower
Week 6	Maintenance of Split units
Week 7	Maintenance of air washer units

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	HVAC and Refrigeration Preventive Maintenance 1st Edition	No
Recommended Texts	Fundamentals Of engineering thermodynamics, Michael J. Moran and Howard N. Shapiro, Fifth edition	No
Websites		

Grading Scheme

مخطط الدرجات

Group	Grade	التقدير	Marks %	Definition
Success Group (50 - 100)	A – Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C – Good	جيد	70 - 79	Sound work with notable errors
	D – Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E – Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 – 49)	FX – Fail	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note: Marks Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.

Code	Course/Module Title	ECTS	Semester
RAC 303	Maintenance of Refrigeration & Air Conditioning Systems	8	6
Class (hr/w)	Lect/Lab./Prac./Tutor	SSWL (hr/sem)	USWL (hr/w)
2	3	78	122
Description			
<p>A course on Maintenance of Refrigeration & Air Conditioning Systems s the following sections:</p> <ol style="list-style-type: none"> 1. Introducing students to defined the tools, materials and instruments 2. To understand the Maintenance of domestic refrigerator 3. To help the student to maintenance Windows air-conditioner 4. To explain to maintenance disassembly compressor of automobile air conditioning equipment 5. To maintenance Remote Split units 6 To maintenance fans of motors 7. Maintenance of water pumps 8 To explain the student to clean and Maintenance of cooling towers 			