	Ministry of Higher Education and Scientific Research - Iraq University of Warith Al-Anbiyaa College of Advanced Technologies Department of Refrigeration and Air Conditioning Techniques Engineering	

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Theory of Machine and Vibrations**			**Module Delivery**	
Module Type	**C**			☐ **Theory**	
Module Code	**HVAC309**			☒ **Lecture**	
ECTS Credits	**6**			☒ **Lab**	
SWL (hr/sem)	**150**			☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Level	**3**	**Semester of Delivery**	**1**		
Administering Department	**M.SC-HVAC**	**College**	**Advanced Technologies**		
Module Leader	**Mustafa Abbas**	**e-mail**	**mustafa.abbas@uowa.edu.iq**		
Module Leader's Acad. Title	**Asst.Lect**	**Module Leader's Qualification**	**M.Sc.**		
Module Tutor	**None**	**e-mail**	**E-mail**		

Peer Reviewer Name		**e-mail**	
Scientific Committee Approval Date	**31/08/2026**	**Version Number**	**1.0**
Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	**HVAC106**	**Semester**	**L1,S2**
Co-requisites module	**None**	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	**To study the principles of electrical machines and electronic devices that are necessary for refrigeration and air conditioning engineer.**
Module Learning Outcomes	**Upon completion of the course, students should be able to:** **1. Be able to analyze DC motor** **2. Calculate the current and voltage of Motor then calculate the Torque** **3. Compare between single phase and three phase motor**
Indicative Contents	
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	**Assessment is based on hand-in assignments, written exam, Case study, Quizzes, seminars, Practical testing and Online testing.**
Student Workload (SWL) الحمل الدراسي للطالب	

Structured SWL (h/sem)	**88**	**Structured SWL (h/w)**	**6**
Unstructured SWL (h/sem)	**62**	**Unstructured SWL (h/w)**	**4**
Total SWL (h/sem)	**150**		

Module Evaluation

تقييم المادة الدراسية

As		**Time/Number**	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	**4**	**20% (20)**	**3,5,6,10**	**LO #1,2,…..10**
	Assignments	**2**	**10% (10)**	**7, 8**	**LO # 8**
	Seminar	**1**	**10% (10)**	**11**	**LO # 11**
Summative assessment	**Midterm Exam**	**2 hr**	**10% (10)**	**12**	**LO # 1-12**
	Final Exam	**3hr**	**50% (50)**	**16**	**All**
Total assessment			**100% (100 Marks)**		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري محتوى كل اسبوع يجب ان يغطي الوقت المحدد

Week	**Material Covered**
Week 1	**D.C motors, construction, commutator, types of D.C motors**
Week 2	**Starting of D.C motor, starter connection, torque of D.C motors**
Week 3	**Single phase induction motor, split-phase, capacitor-start, shaded-pole type**
Week 4	**3-phase induction motor , construction , synch. Speed, slip .**
Week 5	**Starting of 3-phase induction motor, star-delta method, step down transformer**
Week 6	**Instruments and measurements, ammeters, voltmeter, ohmmeter, kw - h meters .**
Week 7	**Contactors, relays, timers .. Thermal overload, starter (contactor +timer)**
Week 8	**Fuse, circuit breakers, types, choice**

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Week 9	**Diode, V-I characteristic, half –wave rectifier**
Week 10	**Full-wave rectifier, bridge and center-top transformer rectifier**
Week 11	**Transistor, construction, types**
Week 12	**Saturation, active, break-down region and cutoff regions**
Week 13	**Transistor as amplifier and Transistor as electronic switch.**
Week 14	**Diac – Traic , characteristics applications with SCR .**
Week 15	**Operational amplifier 741.**
Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
Week	**Material Covered**
Week 1	**Basic wiring diagram for electrical measurements**
Week 2	**Test of current, voltage and solid state relay**
Week 3	**Start-up compressor with solid state relay**
Week 4	**Start-up compressor with current relay**
Week 5	**Star delta starter**
Week 6	**Simulation of block for refrigerant , notice the effects**
Week 7	**Simulation of valve damage, notice the effects**
Week 8	**Dismantling of induction motor**
Week 9	**Diode characteristics**
Week 10	**Diode characteristics**

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Week 11	**Half wave rectifier**
Week 12	**Full wave rectifier**
Week 13	**Full wave rectifier with filter**
Week 14	**Diode limiters**
Week 15	**Zener diode**

Learning and Teaching Resources

مصادر التعلم والتدريس

	Text	**Available in the Library?**
Recommended Texts	➢ **Principle of Dc Motor and types**	**No**

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	**FX – Fail**	راسب (قيد المعالجة)	**(45-49)**	**More work required but credit awarded**

(0 – 49)	**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.

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التاريخ : 31-8-2026

العميد: ا.م.د علي باسم محمد
التاريخ : 31-8-2026

أستاذ المادة: م.م. مصطفى عباس
التاريخ :31-8-2026