MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electrical Engineering			Module Delivery	
Module Type	C			☐ Theory ☒ Lecture ☒ Lab ☐ Tutorial ☐ Practical ☐ Seminar	
Module Code	MPAC107				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		1	Semester of Delivery		2
Administering Department		Air-Conditioning and Refrigeration Tech. Eng. Dep	College	Engineering	
Module Leader	Hussein Ali Jaffar		e-mail	hussein.a.j@uowa.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	Module Leader's Qualification		M. Sc.
Module Tutor	Ehsan Sahib		e-mail	Ehsan.sahib@uowa.edu.iq	
Peer Reviewer Name			e-mail		
Scientific Committee Approval Date			Version Number		

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	NA	**Semester**	
Co-requisites module	NA	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims	1. This is the basic subject for all electrical and electronic circuits. 2. This course deals with the basic concept of electrical circuits. 3. To understand voltage, current and power from a given circuit. 4. To develop problem solving skills and understanding of circuit theory through the application of techniques. 5. To understand Kirchhoff's current and voltage Laws problems.
Module Learning Outcomes	Upon completion of the course, students should be able to: 1. Define Ohm's law. 2. List the various terms associated with electrical circuits. 3. Recognize how electricity works in electrical circuits. 4. Describe electrical power, charge, and current. 5. Explain the two Kirchoff's laws used in circuit analysis. 6. Discuss the various properties of resistors, capacitors, and inductors. 7. Discuss the operations of sinusoid and phasors in an electric circuit. 8. Identify the capacitor and inductor phasor relationship with respect to voltage and current.
Indicative Contents	Indicative content includes the following. DC circuits – Current and voltage definitions, Passive sign convention and circuit elements, Combining resistive elements in series and parallel. Kirchhoff's laws and Ohm's law. Anatomy of a circuit, Network reduction. [15 hrs] AC circuits I – Time dependent signals, average and RMS values. Capacitance and inductance, energy storage elements, simple AC steady-state sinusoidal analysis. [15 hrs] AC Circuits II - RL, RC and RLC circuits - Frequency response of RLC circuits, simple filter and band-pass circuits, resonance and Q-factor, use of Bode plots, use of differential equations and their solutions. Time response (natural and step responses). Introduction to second order circuits. [15 hrs] Revision problem classes. [6 hrs] Resistive networks, voltage and current sources, Thevenin equivalent circuits, current and voltage division, input resistance, output resistance, maximum power transfer, RMS and power dissipation, current limiting and over voltage protection. [15 hrs]

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, participation in the exercises, classes interactive tutorials, Quizzes and Practical testing

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem)	112	**Structured SWL (h/w)**	8
Unstructured SWL (h/sem)	94	**Unstructured SWL (h/w)**	6
Total SWL (h/sem)	210		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	4	20% (20)	3,5,9,12	LO #1,2,…..10
	Assignments	2	10% (10)	7, 8	LO # 8
	Report/Lab	1	10% (10)	continuous	LO # 11
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-12
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Resistance, conductance, effect of temp. on the resistance value
Week 2	Oham’s law, series connection, parallel connection, compound connection
Week 3	Voltage and current divider solved examples, kirchhoff’s laws
Week 4	Star-delta conversion examples
Week 5	Thevenin’s theorem, maximum power transfer
Week 6	Nodal method, superposition
Week 7	Alternating voltage and current

Week 8	Frequency, period, instantaneous value of voltage and current
Week 9	Component of A.C circuit, pure resistance, pure inductance, pure capacitance
Week 10	Series A.C circuit, R,L,C in series
Week 11	Impedance, phase angle, resonance, phase diagram
Week 12	Parallel A.C circuit, R,L,C, Admittance, power factor
Week 13	Active, reactive, apparent power in A.C circuit
Week 14	3-phase circuit
Week 15	**Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Using Multimeter to measure Voltage, Current and Resistance
Week 2	Lab 2: Ohm's law.
Week 3	Lab 3: Voltage and current divider rules
Week 4	Lab 4: Kirchhoff's laws
Week 5	Lab 5: Thevenin's Theorem
Week 6	Lab 6: Series RLC circuit
Week 7	Lab 7: Parallel RLC circuit

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach, 2020.	No
Websites	https://docs.google.com/file/d/0B_O5jg0LZ_ZXYlg0WVU1bkhrLTg/edit	

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.