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	UOMU021027		
ECTS Credits	7		
SWL (hr/sem)	210		
Module Level	1	**Semester of Delivery**	2
Administering Department	Air-conditioning and Refrigeration Eng. Tech. Dep.	**College**	UOMU
Module Leader	Name	**e-mail**	E-mail
Module Leader's Acad. Title	Lecturer	**Module Leader's Qualification**	Ph.D.
Module Tutor	Name (if available)	**e-mail**	E-mail
Peer Reviewer Name	Name	**e-mail**	E-mail
Scientific Committee Approval Date	15/07/2023	**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 Aims أهداف المادة الدراسية	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 مخرجات التعلم للمادة الدراسية	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 المحتويات الإرشادية	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) الحمل الدراسي المنتظم للطالب خلال الفصل	112	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعيا	8

Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	94	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	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	3 hr	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 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
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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.