

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Electrical Circuits I		Module Delivery
Module Type	Basic		☒ Theory ☐ Lecture ☒ Lab ☒ Tutorial ☐ Practical ☐ Seminar
Module Code	MDER110		
ECTS Credits	4		
SWL (hr/sem)	125		
Module Level		Semester of Delivery	
Administering Department		College	BENG
Module Leader		e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date		Version Number	1.0

Module description

The DC Electrical Circuits course module teaches the basics of direct current circuits, covering concepts like voltage, current, resistance, and power. You'll learn how to analyze and simplify circuits using tools like Ohm's law and circuit theorems. The module explores practical applications of DC circuits in electronics, power systems, and telecommunications. Overall, it provides a foundation for understanding and working with DC circuits.

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. To develop problem solving skills and understanding of circuit theory through the application of techniques. 2. To understand voltage, current and power from a given circuit. 3. This course deals with the basic concept of electrical circuits. 4. This is the basic subject for all electrical and electronic circuits. 5. To understand Kirchhoff's current and voltage Laws problems. 6. To perform mesh and Nodal analysis.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. List the various terms associated with electrical circuits. 3. Summarize what is meant by a basic electric circuit. 4. Discuss the reaction and involvement of atoms in electric circuits. 5. Describe electrical power, charge, and current. 6. Define Ohm's law. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of sinusoid and phasors in an electric circuit. 9. Discuss the various properties of resistors, capacitors, and inductors. 10. Explain the two Kirchhoff's laws used in circuit analysis. 11. Identify the capacitor and inductor phasor relationship with respect to voltage and current.

Indicative Contents	Indicative content includes the following. ● Fundamentals of Electrical Circuits (Electrical Quantities, Measurements and Components). [6 hrs] ● Ohm's law, Energy, and Power. [3 hrs] ● Kirchhoff's & divider's Laws. [4 hrs] ● Series, Parallel, and Series-Parallel Circuits. [10 hrs] ● Theorems: Norton, Nodal, Mesh, Source Transformation, Maximum Power Transfer, Thevenin and Superposition. [20 hrs] ● Delta-Star Networks. [4 hrs] ● Revision problem classes [6 hrs] ● Laboratory [45 hrs]
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Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Assessment is based on hand-in assignments, written exam, Case study, Quizzes, Practical testing and Online testing.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	94	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	31	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	2.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation					
تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	3,5,7,9,11,13	LO #1, 2, 9 and 10
	Assignments	2	10% (10)	4,5,6,7,8,9,10,11,12,13	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	Continuous	LO # 5, 8 and 10
Summative assessment	Midterm Exam	3 hr	10% (10)	8,15	LO # 1 and 7
	Final Exam	3hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Introduction - Fundamentals of Electrical Circuits
Week 2	Elements of electrical circuits
Week 3	Ohm's law, Energy, and Power
Week 4	Review of Kirchhoff's & divider's Laws
Week 5	Series, Parallel Circuits
Week 6	Series-Parallel Circuits
Week 7	Source Transformation and Superposition Theorem
Week 8	1 st mid exam

Week 9	Mesh Theorem
Week 10	Nodal Theorem
Week 11	Maximum Power Transfer Theorem
Week 12	Thevenin Theorem
Week 13	Norton Theorem
Week 14	Delta-Star Networks
Week 15	2 nd mid exam
Week 16	Final exam

Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction /Basic Laboratory Test and Measurement Equipment
Week 2	Lab 2: Ohm's Law
Week 3	Lab 3: Series DC Circuits
Week 4	Lab 4: Parallel DC Circuits
Week 5	Lab 5: Series-Parallel DC Circuits
Week 6	Lab 6: Superposition Theorem
Week 7	Lab 7: Thevenin's Theorem
Week 8	Lab 8: Nodal Analysis
Week 9	Lab 9: Δ -Y and Y- Δ Conversions
Week 10	Lab 10: Maximum Power Transfer

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts		
Recommended Texts		
Websites		

Grading Scheme مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جدا جيد	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.				