MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**DC Electrical Circuits**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☐ **Lecture** ☒**Lab** ☒ **Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	**UOMU0207011**				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level		UGI	**Semester of Delivery**		1
Administering Department			**College**	NETC	
Module Leader	Ayat Ayad Hussein		**e-mail**		
Module Leader's Acad. Title		Assistant Professor	**Module Leader's Qualification**		Ph.D.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Nasir Hussein Selman	**e-mail**	Coj.nas@atu.edu.iq	
Scientific Committee Approval Date		01/01/2026	**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 أهداف المادة الدراسية	1. To develop problem solving skills and understanding of circuit theory and circuit analysis 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.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how electricity works in electrical circuits. 2. Learn the various terms associated with electrical circuits. 3. Describe electrical power, charge, and current. 4. Define Ohm's law. 5. Learn the basics of circuits connections (series, parallel, and Y-Δ connections). 6. Identify the basic circuit elements and their applications. 7. Explain the basic rules of electric circuits analysis, such as Ohm's law, voltage and current division rules, and Kirchhoff's laws. 8. Explain circuits analysis methods, such as nodal and mesh analysis. 9. Explain circuits analysis theorems, such as Thevenin's and Norton's theorems, in addition to superposition principle. 10. Explain the principles of maximum power transfer and its relationship to circuits analysis theorems.
Indicative Contents المحتويات الإرشادية	Basic Concepts Current and voltage definitions, passive sign convention and circuit elements, combining resistive elements in series and parallel Basic Laws Series and parallel connections, Ohm's law, Kirchhoff's laws, Voltage and current division rules. Series and parallel circuit Circuit Analysis Methods Nodal analysis and Mesh analysis. Circuit Theorems Thevenin's and Norton's theorems, in addition to superposition principle. Three phase circuit

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	The main strategy that will be adopted in delivering this module is to encourage students' participation in the exercises, while at the same time refining and expanding their critical thinking skills. This will be achieved through classes, interactive tutorials and by considering types of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5.5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**175**		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
Summative assessment	**Midterm Exam**	2hr	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	Charge, current, voltage, resistance and conductance
Week 2	power and energy. Power sign convention.
Week 3	Basics of Network Elements, Definition of Nodes, Branches, and Loops, type of sources.
Week 4	Series and parallel circuits: series circuits, voltage divider rule, current divider rule.
Week 5	Star-delta transformations.
Week 6	Kirchhoff's Laws.
Week 7	**Mid-term Exam.**
Week 8	Circuit Analysis - Nodal method.
Week 9	Circuit Analysis – Mesh method.
Week 10	Linearity and Superposition.

Week 11	Source Transformations.
Week 12	Thevenin's Theorem.
Week 13	Norton's Theorem.
Week 14	Maximum power transfer theorem.
Week 15	Preparatory week before the final Exam.
Week 16	**Final Exam.**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Laboratory Equipment Training.
Week 2	Lab 2: Measuring voltage, current and resistance.
Week 3	Lab 3: Ohm's law.
Week 4	Lab 4: Series connections.
Week 5	Lab 5: parallel connections.
Week 6	Lab 6: Voltage divider rule.
Week 7	Lab 7: Voltage divider rule.
Week 8	Lab 8: Star-Delta Transformations
Week 9	Lab 9: Kirchhoff's laws.
Week 10	Midterm exam
Week 11	Lab 10: Thevenin's theorem.
Week 12	Lab 11: Norton's theorem.
Week 13	Lab 12: Superposition principle.
Week 14	Lab 13: Maximum power transfer.
Week 15	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
Recommended Texts	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	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.