MODULE DESCRIPTION FORM

نموذج وصف مادة أسس الهندسة الكهربائية

Module Information معلومات المادة الدراسية					
Module Title	**Fundamental of Electrical Eng.**			**Module Delivery**	
Module Type	**Core**			**58. ☒ Theory** **59. ☐ Lecture** **60. ☒ Lab** **61. ☒ Tutorial** **62. ☐ Practical** **63. ☐ Seminar**	
Module Code	**CSTE1102**				
ECTS Credits	**6**				
SWL (hr/sem)	**150**				
Module Level	1		**Semester of Delivery**	1	
Administering Department	CSTE		**College**	EETC	
Module Leader	Muhand Subhy		**e-mail**	doaa.yousif@mtu.edu.iq	
Module Leader's Acad. Title	Lecturer		**Module Leader's Qualification**	PH.D	
Module Tutor			**e-mail**		
Peer Reviewer Name			**e-mail**		
Scientific Committee Approval Date			**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	64. To develop problem solving skills and understanding of circuit theory through the application of techniques. 65. To understand voltage, current and power from a given circuit. 66. This course deals with the basic concept of electrical circuits. 67. This is the basic subject for all electrical and electronic circuits. 68. To understand Kirchhoff's current and voltage Laws problems. 69. To perform Thevenin's Norton's Theorem. 70. Understanding the Alternating Current Network Types of Alternating Waveforms 71. Understanding the basic principle of series and parallel AC Circuit
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	72. Recognize how electricity works in electrical circuits. 73. List the various terms associated with electrical circuits. 74. Summarize what is meant by a basic electric circuit. 75. Discuss the reaction and involvement of atoms in electric circuits. 76. Describe electrical power, charge, and current. 77. Define Ohm's law. 78. Identify the basic circuit elements and their applications. 79. Discuss the operations of DC circuits in an electric circuit. 80. Discuss the various properties of resistors. 81. Explain the two Kirchhoff's laws used in circuit analysis. 82. Describe Thevenin's theorem and Norton's theorem and how they work 83. Explain the basic concepts o AC Circuits.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. Definition: - Symbols And Abbreviations, Units, Electric Circuit & It's Element. The Direct Current Network. Ohms low, Charge, Force, Work, Power. Circuit Theory 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 Revision problem classes Fundamentals

	Resistive networks, voltage and current sources, Thevenin and Norton equivalent circuits, Conversion Delta To Star Connection, Superposition Method.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	Type something like: 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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	79	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	5
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	71	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	5
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	150		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	2	10% (10)	5, 10	LO #1, 2, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	15% (15)	Continuous	
	Report	1	5% (5)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (40 + 10)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Symbols And Abbreviations, Units, Electric Circuit & its Element, Ohms low.
Week 2	Series Circuits (Resistance in Series) Voltage Divider Rule.
Week 3	Parallel Circuits (Resistances in Parallel) Current Divider Rule.
Week 4	Open and Short Circuits, Source Transformation,
Week 5	Series-Parallel Circuits Transformation.
Week 6	Kirchhoff's Laws: Kirchhoff's current law (KCL) and its use in Network Analysis.
Week 7	Kirchhoff's voltage law (KVL) and its use in Network Analysis
Week 8	Conversion Delta to Star Connection and Conversion Star to Delta Connection
Week 9	Mid Term Exam + Superposition Method
Week 10	Thevenin's Theorem
Week 11	Norton's Theorem
Week 12	The Alternating Current Network Types of Alternating Waveforms, Generation of Alternating Current, and Definitions related to Alternating Waveforms
Week 13	The Mean and Effective Values of Current and Voltage
Week 14	Series and Parallel AC Circuits (R L C)
Week 15	**Preparing for final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: How to use ammeter, voltmeter and ohmmeter.
Week 2	Lab 2: Apply Ohm's Law
Week 3	Lab 3: Continuous Implementation for Lab1 and Lab2
Week 4	Lab 4: Apply Kirchhoff's law to measure current
Week 5	Lab 5: Continuous Implementation for Lab4
Week 6	Lab 6: Apply Kirchhoff's law to measure voltages
Week 7	Lab 7: Continuous Implementation for Lab6
Week 8	Lab 8: Superposition Method
Week 9	Lab 9: Norton's Theorem.

Week 10	Lab 10: Continuous Implementation for Lab9
Week 11	Lab 11: Thévenin's Theorem.
Week 12	Lab 12: Continuous Implementation for Lab11
Week 13	Lab 13: Delta To Star Connection And Conversion Star To Delta Connection
Week 14	Lab 14: Continuous Implementation for Lab13
Week 15	Lab 15: Preparing for 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	https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering	

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.