

# MODULE DESCRIPTION FORM

## نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>Electric Circuits</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code			
ECTS Credits	8		
SWL (hr/sem)	75		
Module Level	2nd	Semester of Delivery	
Administering Department	ICE	College	KHW
Module Leader	Ahmed K. Al Banna	e-mail	akadhim@kecbu.uobaghdad.edu.iq
Module Leader's Acad. Title	Lect.	Module Leader's Qualification	Msc.
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	24/11/2023	Version Number	1.0

Relation with other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Mathematics, physics	Semester	1st
Co-requisites module		Semester	

## Module Aims, Learning Outcomes and Indicative Contents

### أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	The course aims to give the student the following subjects: Learn the basic laws of circuit theory, Learn to analyze simple resistive or dc circuits and Learn to analyze simple sinusoidal RLC circuits.
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	Important: Write at least 6 Learning Outcomes, better to be equal to the number of study weeks. <ol style="list-style-type: none"> <li>1. Understand fundamental electric quantities: voltage, current, electric power and energy and Identify the difference between dependent and independent voltage and current sources.</li> <li>2. Analyze and evaluate responses of circuits containing resistance, capacitance and inductance elements according to fundamental circuit laws.</li> <li>3. Find the node voltages in resistive circuits containing current sources and voltage sources using nodal analysis. Find the mesh currents and branch currents in resistive circuits containing voltage sources and current sources using mesh analysis.</li> <li>4. Analyze resistive circuits containing multiple sources by using superposition. Apply Thevenin's and Norton's theorems to simplify a resistive circuit by finding the Thevenin or Norton equivalent of a two-terminal network</li> <li>5. Apply KVL, KCL, nodal and mesh analysis to circuits containing dependent sources. Apply the source transformation and Y-<math>\Delta</math> transformation to simplify circuits. Evaluate maximum power transfer to a variable load resistance.</li> <li>6. Understand time varying voltage and current and appreciate sinusoidal signals in AC circuits. Find the phasor voltage (current) for a given sinusoidal voltage (current), and find the sinusoidal voltage (current) for given phasor voltage (current) and frequency.</li> </ol>
<b>Indicative Contents</b> المحتويات الإرشادية	Indicative content includes the following.  <u>Part A – DC fundamentals</u> Understand the fundamentals of the electric circuits. [5 hrs] Analyze and evaluate responses of circuits according to the different fundamental circuit laws [20 hrs]  <u>Part B – AC fundamentals</u> Analyze and evaluate responses of AC circuits according to the different fundamental circuit laws. [20 hrs]

## Learning and Teaching Strategies

### استراتيجيات التعلم والتعليم

<b>Strategies</b>	
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	Students enrolled in this course will be required to demonstrate their more in-depth knowledge of the course material by solving additional, more challenging exam problems, recitation and documentations and analyze, formulate and solve engineering problems in the field of Information and Communication Engineering.
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<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	75	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	65	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>140</b>		

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

<b>Delivery Plan (Weekly Syllabus)</b> المنهاج الاسبوعي النظري	
	Material Covered
<b>Week 1</b>	complex numbers and simultaneous equation solution
<b>Week 2</b>	basic concepts.
<b>Week 3</b>	Basic laws

<b>Week 4</b>	Bridge circuits Principles and Applications.
<b>Week 5</b>	Method of analysis
<b>Week 6</b>	circuit theorems
<b>Week 7</b>	circuit theorems
<b>Week 8</b>	capacitors and inductors
<b>Week 9</b>	first order circuit
<b>Week 10</b>	AC circuits sinusoids and phasors
<b>Week 11</b>	sinusoidal steady state analysis
<b>Week 12</b>	sinusoidal steady state analysis
<b>Week 13</b>	AC power analysis
<b>Week 14</b>	Frequency response
<b>Week 15</b>	two port networks
<b>Week 16</b>	<b>Preparatory week before the final Exam</b>

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	<b>Material Covered</b>
<b>Week 1</b>	Ohm's law
<b>Week 2</b>	Series and parallel circuits
<b>Week 3</b>	Y- $\Delta$ and $\Delta$ – Y transformation
<b>Week 4</b>	Superposition theorem
<b>Week 5</b>	Thevenin's theorem
<b>Week 6</b>	Norton's theorem
<b>Week 7</b>	Maximum power transfer
<b>Week 8</b>	Bridges
<b>Week 9</b>	AC basics
<b>Week 10</b>	AC basics
<b>Week 11</b>	Series resonance
<b>Week 12</b>	Parallel resonance

<b>Week 13</b>	Passive filters
<b>Week 14</b>	Passive filters
<b>Week 15</b>	Passive filters

<b>Learning and Teaching Resources</b> مصادر التعلم والتدريس		
	<b>Text</b>	<b>Available in the Library?</b>
<b>Required Texts</b>	Fundamentals of Electrical Circuits by Charles K. Alexander and Mathew N. O. Sadiku	Yes
<b>Recommended Texts</b>	Textbook of Electrical Technology by B.L. Theraja.	Yes
<b>Websites</b>		No

<b>Grading Scheme</b> مخطط الدرجات				
<b>Group</b>	<b>Grade</b>	<b>التقدير</b>	<b>Marks %</b>	<b>Definition</b>
<b>Success Group (50 - 100)</b>	<b>A - Excellent</b>	امتياز	90 - 100	Outstanding Performance
	<b>B - Very Good</b>	جيد جدا	80 - 89	Above average with some errors
	<b>C - Good</b>	جيد	70 - 79	Sound work with notable errors
	<b>D - Satisfactory</b>	متوسط	60 - 69	Fair but with major shortcomings
	<b>E - Sufficient</b>	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX – Fail</b>	راسب (قيد المعالجة)	(45-49)	More work required but credit awarded
	<b>F – Fail</b>	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.