



Ministry of Higher Education and  
Scientific Research - Iraq  
Al-Mustaqbal University  
College for engineering and technology  
Department of Biomedical Engineering



## MODULE DESCRIPTOR FORM

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	INTRODUCTORY ELECTRICAL CIRCUIT		Module Delivery
Module Type	CORE		<input checked="" type="checkbox"/> Theory <input checked="" type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	BME203		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	UGx11 UGII	Semester of Delivery	
Administering Department	Type Dept. Code	College	Type College Code
Module Leader	Dr. Husam Faisal Hammood	e-mail	Husam.f.hammood@ <a href="mailto:Husam.f.hammood@utq.edu.iq">utq.edu.iq</a>
Module Leader's Acad. Title	lecture	Module Leader's Qualification	Ph.D.
Module Tutor	None	e-mail	None
Peer Reviewer Name		e-mail	
Review Committee Approval		Version Number	1.0

Relation With Other Modules		
العلاقة مع المواد الدراسية الأخرى		
Prerequisite module	None	Semester

Co-requisites module	None	Semester	
<b>Module Aims, Learning Outcomes and Indicative Contents</b> أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
<b>Module Aims</b> أهداف المادة الدراسية	<ol style="list-style-type: none"> <li>1. To develop problem solving skills and understanding of circuit theory through the application of techniques.</li> <li>2. To understand how voltage, current and power from a given circuit.</li> <li>3. This course deals with the basic concept of electrical circuits.</li> <li>4. This is the basic subject for all electrical and electronic circuits subject.</li> <li>5. To understand Kirchhoff's current and voltage Laws problems.</li> <li>6. To perform mesh and Nodal analysis.</li> <li>7. Explain the principle of superposition and how it can be used to help analyze circuits.</li> <li>8. Recognize Thevenin's and Norton's theorems and know how they can lead to greatly simplified circuits.</li> <li>9. Explain the maximum power transfer concept.</li> </ol>		
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> <li>1. Recognize how electricity works in electrical circuits.</li> <li>2. List the various terms associated with electrical circuits.</li> <li>3. Summarize what is meant by a basic electric circuit.</li> <li>4. Discuss the reaction and involvement of atoms in electric circuits.</li> <li>5. Describe electrical power, charge, and current.</li> <li>6. Define Ohm's law.</li> <li>7. Identify the basic circuit elements and their applications.</li> </ol>		
<b>Indicative Contents</b> المحتويات الإرشادية	<p>Indicative content includes the following.</p> <p><u>Part A - Circuit Theory</u></p> <p>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, Introduction to mesh and nodal analysis. [30 hrs]</p> <p>Revision problem classes [10 hrs]</p> <p>Fundamentals Resistive networks, voltage and current sources, Thevenin</p>		

	and Norton equivalent circuits, current and voltage division, input resistance, output resistance, maximum power transfer [30 hrs]  Revision problem classes [10 hrs]
<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	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.

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	93	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعياً	6
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	57	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعياً	-
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	150		

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

### Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction - Basic Concepts
Week 2	Basics of Network Elements
Week 3	Resistance and Resistivity, Ohm's Law and Inductance, Capacitance
Week 4	Review of Kirchhoff's Laws, Circuit Analysis - Nodal and Mesh
Week 5	Circuit Analysis - Nodal and Mesh
Week 6	Linearity and Superposition, Source Transformations
Week 7	Thévenin and Norton Equivalents
Week 8	Maximum Power Transfer
Week 9	Mid-term Exam
Week 10	First-Order Circuits
Week 11	The Source-Free RC Circuit
Week 12	The Source-Free RL Circuit
Week 13	Step Response of an RC Circuit
Week 14	Step Response of an RL Circuit
Week 15	Preparatory Week
Week 16	Final Exam

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Lab 1: Introduction to Agilent VEE and PSPICE
Week 2	Lab 2: Ohm's Law
Week 3	Lab 3: Kirchhoff's Laws
Week 4	Lab 4 Thévenin's Theorem
Week 5	Lab 5: : Norton's Theorem
Week 6	Lab 6: First-Order Transient Responses
Week 7	Lab 7: Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
<b>Required Texts</b>	Fundamentals of Electric Circuits, C.K. Alexander and M.N.O Sadiku, McGraw-Hill Education	Yes
<b>Recommended Texts</b>	DC Electrical Circuit Analysis: A Practical Approach Copyright Year: 2020, dissidents.	No
<b>Websites</b>	<a href="https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering">https://www.coursera.org/browse/physical-science-and-engineering/electrical-engineering</a>	

**APPENDIX:**

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
<b>Success Group (50 - 100)</b>	<b>A</b> - Excellent	امتياز	90 - 100	Outstanding Performance
	<b>B</b> - Very Good	جيد جدا	80 - 89	Above average with some errors
	<b>C</b> - Good	جيد	70 - 79	Sound work with notable errors
	<b>D</b> - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	<b>E</b> - Sufficient	مقبول	50 - 59	Work meets minimum criteria
<b>Fail Group (0 - 49)</b>	<b>FX</b> – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	<b>F</b> – Fail	راسب	(0-44)	Considerable amount of work required

**Note:**

NB 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.