



Ministry of Higher Education and  
Scientific Research - Iraq  
Al-Mustaqbal University  
College of Engineering Technique  
Department of Electrical Engineering Technique



## Module Descriptor Form

### نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	<b>DC Motors</b>		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory Lecture <input checked="" type="checkbox"/> Lab Tutorial <input checked="" type="checkbox"/> Practical <input checked="" type="checkbox"/> Seminar
Module Code	UOMU0205041		
ECTS Credits	6		
SWL (hr/sem)	150		
Module Level	2	Semester of Delivery	
Administering Department	Electrical Engineering Techniques	College	Al-Mustaqbal
Module Leader	Mohammed Ahmed Ibrahim	e-mail	
Module Leader's Acad. Title		Module Leader's Qualification	
Module Tutor	Name (if available)	e-mail	E-mail
Peer Reviewer Name	Name	e-mail	E-mail
Scientific Committee Approval Date	01/06/2023	Version Number	1.0

## Relation with other Modules

العلاقة مع المواد الدراسية الأخرى

<b>Prerequisite module</b>	None	<b>Semester</b>	
<b>Co-requisites module</b>	None	<b>Semester</b>	

## Module Aims, Learning Outcomes and Indicative Contents

أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية

<b>Module Objectives</b> أهداف المادة الدراسية	<ol style="list-style-type: none"><li>1. Understand the basic principles, construction, and working of DC motors.</li><li>2. Identify the different types of DC motors, including brushed and brushless motors, and their applications.</li><li>3. Calculate the torque and speed of DC motors using various equations and formulas.</li><li>4. Analyze the performance characteristics of DC motors, including efficiency, power factor, and speed control.</li><li>5. Develop an understanding of maintenance procedures for DC motors, including cleaning, lubrication, and inspection of electrical components.</li><li>6. Implement safety measures for working with DC motors, including risk assessment, protective gear, and emergency procedures.</li><li>7. Explore the various applications of DC motors in different industries, such as industrial automation, robotics, and electric vehicles.</li></ol>
<b>Module Learning Outcomes</b> مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"><li>1. Understand the basic principles, construction, and working of DC motors.</li><li>2. Identify the different types of DC motors, including brushed and brushless motors, and their applications.</li><li>3. Calculate the torque and speed of DC motors using various equations and formulas.</li><li>4. Analyze the performance characteristics of DC motors, including efficiency, power factor, and speed control.</li><li>5. Develop an understanding of maintenance procedures for DC motors, including cleaning, lubrication, and inspection of electrical components.</li><li>6. Implement safety measures for working with DC motors, including risk assessment, protective gear, and emergency procedures.</li><li>7. Explore the various applications of DC motors in different industries, such as industrial automation, robotics, and electric vehicles.</li></ol>
<b>Indicative Contents</b> المحتويات الإرشادية	<ol style="list-style-type: none"><li>1. Introduction to DC motors and their basic principles</li><li>2. Construction of DC motors, including stator, rotor, commutator, and brushes</li><li>3. Working of DC motors, including the Lorentz force and electromagnetic induction</li><li>4. Types of DC motors, including brushed and brushless motors, and their</li></ol>

	<p>applications</p> <p>5. Torque and speed calculations for DC motors using various equations and formulas</p> <p>6. Performance characteristics of DC motors, including efficiency, power factor, and speed control</p> <p>7. Maintenance procedures for DC motors, including cleaning, lubrication, and inspection of electrical components</p> <p>8. Safety measures for working with DC motors, including risk assessment, protective gear, and emergency procedures</p> <p>9. Applications of DC motors in different industries, such as industrial automation, robotics, and electric vehicles</p> <p>10. Future developments in DC motor technology and their potential impact on various industries.</p>
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<b>Learning and Teaching Strategies</b> استراتيجيات التعلم والتعليم	
<b>Strategies</b>	<p>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 types of simple experiments involving some sampling activities that are interesting to the students.</p>

<b>Student Workload (SWL)</b> الحمل الدراسي للطالب محسوب لـ ١٥ اسبوعا			
<b>Structured SWL (h/sem)</b> الحمل الدراسي المنتظم للطالب خلال الفصل	78	<b>Structured SWL (h/w)</b> الحمل الدراسي المنتظم للطالب أسبوعيا	5.2
<b>Unstructured SWL (h/sem)</b> الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	<b>Unstructured SWL (h/w)</b> الحمل الدراسي غير المنتظم للطالب أسبوعيا	4.8
<b>Total SWL (h/sem)</b> الحمل الدراسي الكلي للطالب خلال الفصل	<b>150</b>		

<b>Module Evaluation</b> تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
<b>Formative</b>	<b>Quizzes</b>	4	10% (10)	5 and 10	LO #1, #2 and #7

assessment	Assignments	10	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	7	10% (10)	Continuous	All
	Report	8	10% (10)	2,4,5,6,9,10,11	LO #5, #7
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	DC motor, principle of dc motors torque develops in motor
Week 2	reverse direction of rotation – back e.m.f. equivalent
Week 3, 4	Circuit – calculation of torque – torque characteristics – speed characteristics
Week 5, 6, 7	Type of dc motor and their characteristics.
Week 8,9	Speed control of D.C. motor
Week 10	Losses in dc motor and generators swine brush test.
Week 11	Electric braking of D.C. motor
Week 12	Necessity of D.C. motor starter
Week 13	Testing of D.C. machines
Week 14	Losses in dc motor and generators swine brush test.
Week 14	Final Examination

### Delivery Plan (Weekly Lab. Syllabus)

المنهاج الاسبوعي للمختبر

	Material Covered
Week 1	Shunt Motor No Load Test
Week 2	Shunt Motor Characteristic
Week 3	Shunt Motor No Load Test
Week 4	Speed control of D.C shunt motor using Flux and Rheostatic control
Week 5	Speed Control of DC Shunt Motor Using Variable Supply Voltage

Week 6	Speed Control of DC series Motor Using Variable Supply Voltage
Week 7	DC Shunt Motor Load test
Week 8	DC Motor Load test
Week 9	Speed control for D.C motor, (Uncontrolled)
Week 10	Speed Control of DC Motor (Controlled Rectifiers)
Week 11	Load test of DC series motor and find the curves
Week 12, 13	Load test on DC cumulatively compounded motor
Week 14	Review

Learning and Teaching Resources		
مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	ELECTRICAL TECHNOLOGY B.L. THERAJA A.K. THERAJA	Yes
Recommended Texts	Electric Machinery and Transformers Bhag S. Guru	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 is required but credit awarded
	F – Fail	راسب	(0-44)	A 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.