Ministry of Higher Education and

Scientific Research - Iraq

Al-Furat Al-Awsat Technical University

Technical College /Al-Mussaib Department of Electrical Engineering Techniques

Module Descriptor Form

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**DC Motors**			**Module Delivery**	
Module Type	**Core**			☒ **Theory** **Lecture** ☒ **Lab** **Tutorial** ☒ **Practical** ☒ **Seminar**	
Module Code	ATU٢٣٠٤١				
ECTS Credits	٦				
SWL (hr/sem)	١٥٠				
Module Level	٢		**Semester of Delivery**	٢	
Administering Department	Electrical Engineering Techniques		**College**	Al-Furat Al-Awsat Technical University Technical College /Al-Mussaib	
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	٠١/٠٦/٢٠٢٣		**Version Number**	١,٠	

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	١. Understand the basic principles, construction, and working of DC motors. ٢. Identify the different types of DC motors, including brushed and brushless motors, and their applications. ٣. Calculate the torque and speed of DC motors using various equations and formulas. ٤. Analyze the performance characteristics of DC motors, including efficiency, power factor, and speed control. ٥. Develop an understanding of maintenance procedures for DC motors, including cleaning, lubrication, and inspection of electrical components. ٦. Implement safety measures for working with DC motors, including risk assessment, protective gear, and emergency procedures. ٧. Explore the various applications of DC motors in different industries, such as industrial automation, robotics, and electric vehicles.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	١. Understand the basic principles, construction, and working of DC motors. ٢. Identify the different types of DC motors, including brushed and brushless motors, and their applications. ٣. Calculate the torque and speed of DC motors using various equations and formulas. ٤. Analyze the performance characteristics of DC motors, including efficiency, power factor, and speed control. ٥. Develop an understanding of maintenance procedures for DC motors, including cleaning, lubrication, and inspection of electrical components. ٦. Implement safety measures for working with DC motors, including risk assessment, protective gear, and emergency procedures. ٧. Explore the various applications of DC motors in different industries, such as industrial automation, robotics, and electric vehicles.
Indicative Contents المحتويات الإرشادية	١. Introduction to DC motors and their basic principles ٢. Construction of DC motors, including stator, rotor, commutator, and brushes ٣. Working of DC motors, including the Lorentz force and electromagnetic induction ٤. Types of DC motors, including brushed and brushless motors, and their applications ٥. Torque and speed calculations for DC motors using various equations and formulas ٦. Performance characteristics of DC motors, including efficiency, power factor, and speed control ٧. Maintenance procedures for DC motors, including cleaning, lubrication, and inspection of electrical components ٨. Safety measures for working with DC motors, including risk assessment, protective gear, and emergency procedures ٩. Applications of DC motors in different industries, such as industrial automation, robotics, and electric vehicles ١٠. Future developments in DC motor technology and their potential impact on various industries.

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 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	٧٨	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	٥,٢
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	٧٢	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	٤,٨
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	١٥٠		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	**Weight (Marks)**	**Week Due**	**Relevant Learning Outcome**
Formative assessment	**Quizzes**	٤	١٠٪ (١٠)	٥ and ١٠	LO #١, #٢ and #٧
	Assignments	١٠	١٠٪ (١٠)	٢ and ١٢	LO #٣, #٤ and #٦, #٧
	Projects / Lab.	٧	١٠٪ (١٠)	Continuous	All
	Report	٨	١٠٪ (١٠)	٢,٤,٥,٦,٩,١٠,١١	LO #٥, #٧
Summative assessment	**Midterm Exam**	٢hr	١٠٪ (١٠)	٧	LO #١ - #٧
	Final Exam	٣hr	٥٠٪ (٥٠)	١٦	All
Total assessment			١٠٠٪ (١٠٠ Marks)		

Delivery Plan (Weekly Syllabus) المنهاج الاسبوعي النظري	
	Material Covered
Week ١	**DC motor, principle of dc motors torque develops in motor**
Week ٢	**reverse direction of rotation – back e.m.f. equivalent**
Week ٣, ٤	**Circuit – calculation of torque – torque characteristics – speed characteristics**
Week ٥, ٦, ٧	**Type of dc motor and their characteristics.**
Week ٨,٩	**Speed control of D.C. motor**
Week ١٠	**Losses in dc motor and generators swine brush test.**
Week ١١	**Electric braking of D.C. motor**
Week ١٢	**Necessity of D.C. motor starter**
Week ١٣	**Testing of D.C. machines**
Week ١٤	**Losses in dc motor and generators swine brush test.**
Week ١٤	**Final Examination**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week ١	**Shunt Motor No Load Test**
Week ٢	**Shunt Motor Characteristic**
Week ٣	**Shunt Motor No Load Test**
Week ٤	**Speed control of D.C shunt motor using Flux and Rheostatic control**
Week ٥	**Speed Control of DC Shunt Motor Using Variable Supply Voltage**
Week ٦	**Speed Control of DC series Motor Using Variable Supply Voltage**
Week ٧	**DC Shunt Motor Load test**
Week ٨	**DC Motor Load test**
Week ٩	**Speed control for D.C motor, (Uncontrolled)**
Week ١٠	**Speed Control of DC Motor (Controlled Rectifiers)**
Week ١١	**Load test of DC series motor and find the curves**
Week ١٢, ١٣	**Load test on DC cumulatively compounded motor**
Week ١٤	**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 (٥٠ - ١٠٠)	**A** - Excellent	امتياز	٩٠ - ١٠٠	Outstanding Performance
	B - Very Good	جيد جدا	٨٠ - ٨٩	Above average with some errors
	C - Good	جيد	٧٠ - ٧٩	Sound work with notable errors
	D - Satisfactory	متوسط	٦٠ - ٦٩	Fair but with major shortcomings
	E - Sufficient	مقبول	٥٠ - ٥٩	Work meets minimum criteria
Fail Group (٠ – ٤٩)	**FX** – Fail	راسب (قيد المعالجة)	(٤٥-٤٩)	More work is required but credit awarded
	F – Fail	راسب	(٠-٤٤)	A considerable amount of work required

Note: Marks Decimal places above or below ٠,٥ will be rounded to the higher or lower full mark (for example a mark of ٥٤,٥ will be rounded to ٥٥, whereas a mark of ٥٤,٤ will be rounded to ٥٤. 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.