MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Power Electronics**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☒**Lecture** ☒**Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	**UOMU0204064**				
ECTS Credits	**5**				
SWL (hr/sem)	**125**				
Module Level	UGIII		**Semester of Delivery**	6	
Administering Department	MIET		**College**	EECT	
Module Leader	Dr. Ziyad Taha Yasin + MSc. Amir Mohammed Khalaf		**e-mail**	Zeyad.Taha.yaseen@uomus.edu.iq+ amir.mohammed.khalaf@uomus.edu.iq	
Module Leader's Acad. Title	Professor		**Module Leader's Qualification**	Ph.D.	
Module Tutor	Dr. Ziyad Taha Yasin + MSc. Amir Mohammed Khalaf		**e-mail**	Zeyad.Taha.yaseen@uomus.edu.iq+ amir.mohammed.khalaf@uomus.edu.iq	
Peer Reviewer Name	Dr. Ziyad Taha Yasin		**e-mail**	Zeyad.Taha.yaseen@uomus.edu.iq	
Scientific Committee Approval Date	8/11/2023		**Version Number**	1.0	

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	Electronic circuits II	**Semester**	UGII-S4
Co-requisites module	None	**Semester**	

Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية	
Module Aims أهداف المادة الدراسية	1. To develop problem solving skills and understanding of power electronic theory through the application of techniques. 2. To understand thyristor ,transistor as switching from a given circuit. 3. This course deals with the basic concept of rectifier . 4. This is the basic subject chopper. 5. To understand ac-ac converter, inverter. 6. Application of power electronics especially in medical instrument.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Recognize how power electronic works in electrical circuits. 2. List the various terms associated with power electronic. 3. Summarize what is meant by a basic with power electronic. 4. Discuss the reaction and involvement of in rectifier circuit. 5. Describe thyristor ,transistor diode . 6. Dc- dc converter. 7. Identify the basic circuit elements and their applications. 8. Discuss the operations of ac-ac converter. 9. Discuss the various properties inverter. 10. Explain the applications of power electronics in industry especially in medical equipment .
Indicative Contents المحتويات الإرشادية	Indicative content includes the following. <u>Part A - Circuit Theory</u>]Diode and Transistor Thyristor as switch its characteristic ,protection, triggering circuit. [15 hrs.] AC circuits I –Single phase half wave and full wave Rectifier . [10 hrs] Revision problem classes [5 hrs]

	Part B Applications dc-dc converter ,stepdown and step up chopper. [15 hrs] Single phase and three phase inverters. [15 hrs] Applications oof power Electronics UPS.SMPS and Health car application. [10 hrs]

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	46	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	3
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

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, 8 and 10
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	8	15% (10)	Continuous	
	Report	1	5% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2 hr	10% (10)	7	LO # 1-7
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)

المنهاج الاسبوعي النظري

	Material Covered
Week 1	Introduction to power electronics. Lect.1and 1a
Week 2	Switching devices, power & control device
Week 3	Types and characteristic, rating (diode, transistor …).
Week 4	Methods of turning – on & turning – off.
Week 5	Protection of power devices.
Week 6	Triggering & base drive circuits. Controlled rectifiers, 1 – phase
Week 7	Mid-Exam
Week 8	Controlled Rectifier 3 – phase circuits
Week 9	Half – wave & full – wave circuits3 phase Rectifiers.
Week 10	D.C choppers; step – up & step – down choppers
Week 11	A.C phase controllers.
Week 12	Invertors, 1 – phase & 3 – phase bridges
Week 13	Some applications: a – uninterruptible power supply UPS).
Week 14	switching mode power supply (SMPS)
Week 15	**Application of power Electronics in medical instruments** **Preparatory week before the final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Uncontrolled Resistive Half Wave Rectifier with Load.
Week 2	Controlled Half Wave Rectifier with Resistive Load.
Week 3	Controlled Half Wave Rectifier with Inductive Load.
Week 4	Single Phase Full Wave Rectifier (Bridge) /Part I.
Week 5	Single Phase Full Wave Rectifier (Bridge) /Part II.
Week 6	Three Phase Half Wave Rectifier.
Week 7	Three Phase Full Wave Rectifier.
Week 8	Single Phase Half Bridge Inverter/ Part 1.
Week 9	Single Phase Half Bridge Inverter/ Part 2.
Week 10	Single Phase Full Bridge Inverter.
Week 11	Single-Phase Half Wave AC Voltage Controller.
Week 12	Single-Phase Full wave AC Voltage Controller.
Week 13	Step-Down DC Chopper.
Week 14	Step-Down DC Chopper.

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Power Electronics By Lander	Yes
Recommended Texts	Power Electronics and drive By Mohmmed T.Lazim	No
Websites	M.T.Lazim	

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.