MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Electronic Circuits Design			**Module Delivery**	
Module Type	C			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☒ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOMU0207031				
ECTS Credits	6				
SWL (hr/sem)	150				
Module Level		UGII	**Semester of Delivery**		1
Administering Department			**College**	NETC	
Module Leader	Nasir Hussein Selman		**e-mail**	Coj.nas@atu.edu.iq	
Module Leader's Acad. Title		Lecturer	**Module Leader's Qualification**		M.Sc.
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name		Nasir Hussein Selman	**e-mail**	Coj.nas@atu.edu.iq	
Scientific Committee Approval Date		01/10/2024	**Version Number**		1.0

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	1. The student learns about the basic construction and operation of a power electronic. 2. Identify and be able to explain the characteristics all types of rectifier circuits. 3. Being able to identify Chopper circuits. 4. Able to design inverter circuits 5. Able to design Voltage controller
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Knowing the concepts of power electronic. 2. Knowing about the Thyristor principle and application 3. Enabling to design inverter and chopper circuits
Indicative Contents المحتويات الإرشادية	- Power electronics - Thyristor principle and application - Controlled rectifier - Inverter - Choppers

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	78	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	7
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	72	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	**150**		

Module Evaluation
تقييم المادة الدراسية

		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	5 and 10	LO #1, #2 and #10, #11
	Assignments	2	10% (10)	2 and 12	LO #3, #4 and #6, #7
	Projects / Lab.	1	10% (10)	Continuous	All
	Report	1	10% (10)	13	LO #5, #8 and #10
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	Power electronics systems: Power semiconductor diode : basic structure of power diode, I-V characteristics of power diode.
Week 2	power diode types (general purpose, fast switching and sckootky diodes), effect of forward and reverse recovery time of diode, diodes and rectifier circuit (half wave and full wave).
Week 3	Power transistor: bipolar junction transistor
Week 4-5	Power MOSFET, insulated Gate BJT, IGBJT structure
Week 6	Thyristor principle and application: basic structure of thyristor, I-V characteristics, two transistor model of thyristor
Week 7	turn-ON and turn-OFF characteristics, thyristor gate characteristics
Week 8	thyristor protection circuit, di/dt protection circuit, dv/dt protection circuit
Week 9	thyristor commutation circuit, series and parallel connection of thyristor, thyristor types
Week 10	controlled rectifier: single phase half wave rectifier (R, RL) load, freewheeling diode single phase full wave rectifier (RL)
Week 11&12	inverter : classification of inverter , single phase half wave inverter, single phase full bridge wave inverter
Week 13	Voltage controller: introduction to voltage controller, principle of ON-OFF control
Week 14&15	Choppers: introduction to chopper, basic classification of chopper, basic operation.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Introduction to the lab tools which uses in the experiments.
Week 2 -3	**Thyristor** operation, **Thyristor** protection
Week 4&6	**Thyristor** applications
Week 7	Midterm exam
Week 8-9	controlled rectifier
Week 10 -12	Single phase inverter
Week 13 & 14	Chopper
Week 15	Final exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Power electronics devices, circuits, and applications by Muhammad H. Rashid	No
Recommended Texts	electronic-devices-9th-edition-by-floyd	Yes
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 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.