MODULE DESCRIPTOR FORM
نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	ELECTRONIC CIRCUITS			**Module Delivery**	
Module Type	CORE			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐**Tutorial** ☒ **Practical** ☐ **Seminar**	
Module Code	UOMU0207022				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UGI	**Semester of Delivery**		2
Administering Department			**College**		
Module Leader	Bushra Majed Hamed		**e-mail**	bushra.majed.hamed@uomus.edu.iq	
Module Leader's Acad. Title		Assistant Lecturer	**Module Leader's Qualification**		MSc
Module Tutor	Name (if available)		**e-mail**	E-mail	
Peer Reviewer Name			**e-mail**		
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 Aims أهداف المادة الدراسية	The student learns about the basic construction and operation of a bipolar transistor. And be able to apply appropriate biasing to secure operation in the active area. 1. Identify the characteristics of a BJT (NPN or PNP) and their response.		

	2. Student will be able to determine DC and AC load line. of important BJT configurations. 3. Understand the BJT transistor configuration. 4. The student will also be familiar with the saturation and cut-off conditions of the BJT. 5. Define the application of BJT transistor. 6. Identify FET, JFETs and MOSFET transistors, construction and characteristics 7. Learns about the basic construction and operation of a multistage amplifiers.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enable to know the concepts of BJT and FET transistors, know about the BJT and FET transistors configurations. 2. Enabling student to design of BJT circuits. 3. Understand the basic operation of transistor and applications 4. Enabling student to test the transistor 5. Enabling student to know the Design of multistage amplifiers.
Indicative Contents المحتويات الإرشادية	Indicative content includes the following: Introduction to aviation electronics and its role in aircraft systems. 1. Basic BJT principles, operation and configurations. 2. Basic FET principles, operation and configurations. 3. Basic MOSFET principles, operation and configurations. 4. Multistage amplifiers
Strategies	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 showing the students how the construction members exposed to external loads .This can be done by films or videos or by the ready structural software.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (hr/sem) (SSWL) الحمل الدراسي المنتظم للطالب خلال الفصل	93	**Structured SWL (h/w)** الحمل الدراسي المنتظم للطالب أسبوعيا	93/15 =6.2
Unstructured SWL (hr/sem)(USSWL) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	82/15=5.5
Total SWL (hr/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

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, 10 and 11
	Assignments	2	10% (10)	2, 12	LO # 3, 4, 6 and 7
	Projects / Lab.	1	10% (10)	Continuous	
	Report	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	**Midterm Exam**	2 hr	10% (10)	7	LO # 1-7
	Final Exam	3 hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)
المنهاج الاسبوعي النظري

	Material Covered
Week	**Syllabus**
Week 1&2	Bipolar junction transistor, BJT operation, transistor configurations; common base configuration common emitter configuration, and common collector configuration, DC load line, Limits of operation.
Week 3	Analysis of Fixed bias configuration, voltage divider bias configuration.
Week 4	Collector feedback configuration; saturation level and load line analysis, emitter flower configuration, Design operation.
Week 5	Transistor switching networks, Multiple BJT networks, bias stabilization.
Week 6&7	BJT AC analysis, amplification in AC domain, BJT modeling, the “r e” transistor model, determine the current and voltage gain, two-port system approach, The Hybrid Equivalent Model, cascade system, frequency response of BJT amplifiers.
Week 8-10	Field effect transistors, FET types, FET fixed bias configuration, self-bias configuration, voltage divider configuration, common-gate configuration. FET amplifiers. junction FETs, construction and characteristics of JFETs, transfer characteristics, specification sheets (JFETs).

Week 11&12	MOSFETs, depletion type MOSFET, enhancement type MOSFET, MOSFET Handling. E-MOSFET drain feedback configuration, E-MOSFET voltage divider configuration, Designing FET amplifier networks
Week 13-15	BJT and JFET frequency response, Logarithms, decibel, general frequency consideration, normalization process, low frequency analysis, low frequency response-BJT amplifier with RL, impact Rs on the BJT low frequency response, low-frequency response FET amplifier, Miller effect capacitance, high-frequency response -BJT amplifier, high frequency response-FET amplifier, multistage frequency effect.
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Lab 1: Introduction to the lab tools which uses in the experiments
Week 2	Lab 2: BJT Transistor Characteristics.
Week 3	Lab 3: Transistor CE Characteristics.
Week 4	Lab 4: Transistor CB Characteristics.
Week 5	Lab 5: Transistor CC Characteristics.
Week 6	Lab 6: Transistor as switch
Week 7	Lab 7: Frequency response of common emitter amplifier.
Week 8	Lab 8: Frequency response of common base amplifier.
Week 9	Mid Term exam.
Week 10	Lab 10: FET Transistor Characteristics.
Week 11	Lab 11: FET common Source Characteristics.
Week 12	Lab 12: FET common drain Characteristics.
Week 13	Lab 13: MOSFET Transistor Characteristics.
Week 14	Lab 14: Multistage amplifiers.
Week 15	Lab 15: Multistage amplifiers.
Week 16	Final Exam

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	Electronic devices electronic flow version by Thomas L. Floyd	yes
Recommended Texts	Electronic Devices And Circuit Theory by R. Boylston.	yes
Websites		

APPENDIX:

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	مقبول بقرار	(45-49)	More work required but credit awarded
	F – 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.