MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	Integrated electronic circuits			**Module Delivery**	
Module Type	C			☒ **Theory** ☐ **Lecture** ☒ **Lab** ☐ **Tutorial** ☐ **Practical** ☐ **Seminar**	
Module Code	UOMU0207042				
ECTS Credits	7				
SWL (hr/sem)	175				
Module Level		UGII	**Semester of Delivery**		2
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**		Ph.D.
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		30/09/2025	**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. Understanding of Integrated Circuits. 2. To Define types of Integrated Circuits. 3. To Know the application on integrated Circuits. 4. To understand the design of integrated Circuits.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Enabling student to know the concepts of IC 2. learning the type of IC. 3. Enabling student to know about the Construction of IC. 4. Enabling student to design Many application of IC. 5. Understand the basic operation of some types of IC 6. Enabling student to Select the suitable IC for the applications
Indicative Contents المحتويات الإرشادية	• introduction to IC • Working with Power point • Theoretical lectures • Lab.

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	different examples. Using different styles of discussion that aim to connect the theoretical and practical sides. Asking questions and giving exercises that require analysis and conclusions related to lectures. Encourage students to participate in discussions and do the practical work. Encourage students to work in groups..

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	97	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6
Total SWL (h/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 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 1-2	Introduction to Integrated Circuits, Types of integrated circuits, Analog Integrated Circuits, digital integrated circuits, Programmable Integrated Circuits, Integrated Circuit Applications, Advantages of integrated circuits, Future trends in integrated circuit technology
Week 3-10	operational amplifier, applications (linear and non-linear applications): inverting, noninverting, voltage follower, adder, subtractor, integrator and differential, comparator, zero crossing detector, voltage bounding, log and antilog, Analog to Digital Converters, Digital to Analog Converters, active filters design (Butterworth filter).
Week 11-12	Feedback Amplifier, Oscillators: Positive feedback and oscillation, Stability of Oscillation, Oscillators using OP-AMP: Phase-shift Oscillator, Wien Bridge Oscillator, Hartley Oscillator, Crystal Oscillator.
Week 13-15	Timing circuits 555 timer applications, 555 timer as a mono stable multivibrator and a bistable multivibrator
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1 &2	Op-Amp Voltage Followers and Noninverting Amplifiers, Inverting Amplifiers
Week 3 &4	Summing and Difference Amplifiers

Week 5	Differentiator and integrator
Week 6 &7	Lowpass, Bandpass and High pass active Filters
Week 8	Midterm exam
Week 9 &10	Analog to Digital Converters, Digital to Analog converters
Week 11 & 12	Different Oscillators
Week 13 & 14	555 IC Operating as Astable Multivibrator, 555 IC Operating as Bistable Multivibrator, 555 IC Operating as Monostable Multivibrator
Week 15	Final exam

Learning and Teaching Resources
مصادر التعلم والتدريس

	Text	Available in the Library?
Required Texts	"Electronic Devices and Circuit Theory", Robert Boylestad, Louis Nashelsky, 10th Edition , 2009.	Yes
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.