MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information معلومات المادة الدراسية					
Module Title	**Analog communication**			**Module Delivery**	
Module Type	**Core**			☒**Theory** ☐**Lecture** ☒**Lab** ☐**Tutorial** ☐**Practical** ☐**Seminar**	
Module Code	UOMU0207041				
ECTS Credits	**7**				
SWL (hr/sem)	**175**				
Module Level	UGII		**Semester of Delivery**	2	
Administering Department			**College**		
Module Leader			**e-mail**		
Module Leader's Acad. Title			**Module Leader's Qualification**		
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. To define the main terms of the analog communication systems. 2. To introduce the concept of modulation. 3. To learn the types of modulation techniques.
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	1. Understanding the parameters of the analog communication system. 2. Recognizing the differences between modulation types. 3. Define the interaction between message signal and carrier signal. 4. Define the theory behind the generation of each modulation type. 5. Understanding the reaction between signals and noise.
Indicative Contents المحتويات الإرشادية	1. Modulation. 2. Amplitude modulation 3. Frequency modulation 4. Analog pulse modulation

Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
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 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	5.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	97	**Unstructured SWL (h/w)** الحمل الدراسي غير المنتظم للطالب أسبوعيا	6.5
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	Modulation: Linear modulation, double-sideband modulation AM and DSB modulators and transmitters; SSB and VSB; frequency conversion; detection and receivers; frequency division multiplexing.
Week 3-6	Amplitude modulation: the AM transmission: the AM spectrum; power considerations; phasor representation; AM modulators; another AM transmitter, Application of AM Systems.
Week 7-10	Frequency modulation: fundamental concepts; Frequency modulation: the FM spectrum; phasor representation; narrowband FM; broadband FM; FM generation; FM transmitter; interference and noise; the PM spectrum PM/FM transmitter.
Week 11	Mid – Term Exam.
Week 12-13	Noise in CW modulation: system models and parameters; interference noise in linear modulation; noise in exponential modulation; comparison of CW modulation system
Week 14-15	Pulse modulation: Analog pulse modulation; PAM, PDM and PPM, pulse-code modulation PCM, DM, and DPCM; time-division multiplexing
Week 16	**Final Exam**

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Am modulation
Week 3	Design Amplitude modulation circuit by Student.
Week 4	Am demodulation
Week 5	Design Amplitude demodulation circuit by Student.
Week 6	Phase Locked Loop (PLL)
Week 7-9	FM modulation using different circuits (CD4046, 555 timer, 565 …etc)
Week 10	FM demodulation
Week 11	Midterm exam
Week 12-15	PM modulation (PAM, PDM and PPM)
Week 16	**Final exam**

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	**Available in the Library?**
Required Texts	1- Introduction to Communication Systems By F. G. Strelmer	yes
Recommended Texts	1- Analog communication textbook by sanjay sharma. 2-Modern digital and analog communication systems by B. P. Lathi & Zhi Ding	no
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.