

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	ATU11408			
ECTS Credits	7			
SWL (hr/sem)	175			
Module Level	UGII	Semester of Delivery		2
Administering Department		College	NETC	
Module Leader	Ahmad H. Hadi		e-mail	Coj.Ahmadhadi@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	1/10/2024	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. 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.