

MODULE DESCRIPTION FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	Data Communications		Module Delivery
Module Type	Core		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	UOMU0202065		
ECTS Credits	5		
SWL (hr/sem)	125		
Module Level	3	Semester of Delivery	6
Administering Department	CET	College	EETC
Module Leader	Haider Jabber Abd	e-mail	Haider.jabber@uomus.edu.iq
Module Leader's Acad. Title	Professor	Module Leader's Qualification	
Module Tutor		e-mail	
Peer Reviewer Name		e-mail	
Scientific Committee Approval Date	1/10/2025	Version Number	1.0

Relation with other Modules العلاقة مع المواد الدراسية الأخرى			
Prerequisite module		Semester	5
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 aims to students in third stage to defined and understand the Digital Modulation Synchronization Line Codes Spread Spectrum Systems Satellite Communication
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<p>1- Describe digital communications modulation and Explain the modulation and demodulation of quadrature amplitude modulation</p> <p>2 -Explain the advantage and disadvantage of each type of digital communications systems</p> <p>4- Discuss the comparison between the types of digital systems and its advantages</p> <p>5- Explain Synchronization</p> <p>6- Describe Spread Spectrum Systems</p> <p>7- Explain types Satellite Communication</p> <p>8-Describe the Advantages and Applications of Microwaves</p>
Indicative Contents المحتويات الإرشادية	<p>Indicative content includes the following.</p> <ul style="list-style-type: none"> - Digital Modulation (10 hr) - Synchronization (10 hr) - Line Codes (10 hr) - Spread Spectrum Systems (15 hr) - Satellite Communication (15hr) - Microwaves(10hr)

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 type of simple experiments involving some sampling activities that are interesting to the students.

Student Workload (SWL) الحمل الدراسي للطالب موزع على (15) اسبوع			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	64	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	4.26
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	61	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	4.06
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	125		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	2	10% (10)	4,9	LO #1-4, LO #4- 8
	Assignments	2	10% (10)	3,10	LO #1-4, LO #4- 8
	Projects / Lab.	10	10% (10)	Continuous	LO #1-8
	Report	10	10% (10)	Continuous	LO #1-8
Summative assessment	Midterm Exam	2 hr	10% (20)	6	LO # 1-8
	Final Exam	4hr	50% (50)	16	All
Total assessment			100% (100 Marks)		

Delivery Plan (Weekly Syllabus)	
المنهاج الاسبوعي النظري	
	Material Covered
Week 1	Digital Modulation: Quadrature Phase Shift Keying (QPSK), Offset QPSK
Week 2	Minimum Shift Keying, Gaussian Minimum Shift Keying (GMSK).
Week 3	Quadrature Amplitude Modulation (QAM), Multilevel Modulation Techniques M-ary PSK, M-ary QAM
Week 4	Synchronization: Phase Locked Loop (PLL) Recovery; Carrier Recovery: square law device,.
Week 5	Costas loop, DF PLL; Clock Recovery: spectrum line method, minimum mean square error, early-late gate method
Week 6	Line Codes: Binary Line Codes; Multilevel Signaling
Week 7	Mid exam
Week 8	Spread Spectrum Systems: Introduction; Advantages and Disadvantages; Pseudo Noise Sequence (PN Sequence) Generation and Properties
Week 9,10	Spread Spectrum Systems: Direct Sequence Spread Spectrum; Frequency Hopping Spread Spectrum (SFH, FFH).
Week 11	Satellite Communication: introduction; Types Of Satellites; Frequency Bands;
Week 12	Satellite Construction; Satellite Link Design;
Week 13	Modulation and Multiplexing Techniques: FDM/FM, TDM; Multiple Access: FDMA, TDMA, CDMA.
Week 14	Typical Frequencies; Band Designation;
Week 15	Introduction to antennas & Microwaves , Advantages of Microwaves; Applications of Microwaves.

Delivery Plan (Weekly Lab. Syllabus)	
المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1	Quadrature Phase Shift Keying (QPSK)
Week 2	Minimum Shift Keying
Week 3	Quadrature Amplitude Modulation (QAM), Multilevel Modulation Techniques M-ary PSK, M-ary QAM
Week 4	Phase Locked Loop (PLL) Recovery
Week 5,6	Direct Sequence Spread Spectrum; Frequency Hopping Spread Spectrum (SFH, FFH).

Week 7	Satellite Link Design; Modulation and Multiplexing Techniques: FDM/FM, TDM
Week 8,9	Design Multiple Access: FDMA, TDMA, CDMA

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	- Sarkar N., Elements of Digital Communications, first edition, 2003	NO
Recommended Texts	- Data Communications and Networking, Fourth Edition by Behrouz A. Forouzan	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.