Syrian Arab Republic		الجمهورية العربية السورية
Ministry of Higher Education		وزارة التعليم العالـــي
Syrian Virtual University		الجامعة الافتراضية السورية

Course Description: Digital Communication

1- Basic Information:

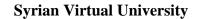| Course Name	Digital Communication
Course ID	TS
Contact Hours (Registered Sessions)	20.5 h
Contact Hours (Synchronized Sessions)	19.5 h
Mid Term Exam	-
Exam	75 min
Registered Sessions Work Load	21
Synchronized Session Work Load	20
Credit Hours	4

2- Pre-Requisites:

Course	ID
Mathmatics	

3- Course General Objectives:

To introduce the principal components of digital communication systems and their types, parameters, communication channels types, and methods of digital data transmission.

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4- Intended Learning Outcomes (ILO):

Code	Intended Learning Outcomes
ILO1	Understanding digital communication system components
ILO2	Understanding signals and their properties in time and frequency domain
ILO3	Understanding analog signal digitization through the study of PCM system
ILO4	Understanding Baseband transmission, channel bandwidth requirements, error rate estimation.
ILO5	Understanding Digital modulation
ILO6	Computing information given by a discrete source, channel capacity and data compactness
ILO7	Knowing type of digital transmission, error detection and correction

5- **Course Syllabus** (19.5 hours of total synchronized sessions; 20.5 hours of total Recorded Sessions)

- **RS:** Recorded Sessions; **SS:** Synchronized Sessions;

ILO	Course Syllabus	RS	SS	Type	Additional Notes
ILO1	Knowing the tasks of every component of Digital communication system, their parameters, types of communication systems and types of channels	1.5	1.5	Exercises Assignments	
ILO2	Signal types, computation of their energy and power and spectrum. The output of a linear system, computation of noise power, signal bandwidth, transmission distortions	4	4.5	Exercises Assignments	
ILO3	PCM system components, computation of encoder bits to ensure a certain	3	3	Exercises Assignments	

	quality, PCM performance estimation and bitrate for PCM				
ILO4	Knowing Types of signals used in baseband transmission, required bandwidth to send binary and multilevel transmissions, computing the bit error rate, methods of bits' scrambling	4	4.5	Exercises Assignments	
ILO5	Some basic digital modulation methods, computation of bandwidth and modulation efficiency	3	1.5	Exercises Assignments	
ILO6	Computing source entropy, minimum transmission rate, lossless data compactness, theoretical channel capacity	2.5	2.25	Exercises Assignments	
ILO7	Knowing synchronous and asynchronous transmission, types of error control, some error detection methods, the principle of the forward error correction and some of its methods, the number of detectable and correctable bits.	2.5	2.25	Exercises Assignments	

6- Assessment Criteria (Related to ILOs)

ISC	Interactive Synchronized Collaboration		Ex	Exams		Rpt	Reports
PF2F	Presentations and Face-to-Face Assessments		PW	Practice Work			

ILO	**ILO**	**Intended**	**Assessment Type**

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Code		Results	ISC	PW	Ex	PF2F	Rpt
ILO1	Understanding digital communication system components	Knowing the tasks of every component of Digital communication system. How to choose the transmission type and the channel type for a transmission system	√		√		
ILO2	Understanding signals and their properties in time and frequency domain	Capability of signal analysis in time and frequency domains, and computation of its energy and power and spectrum. The calculation of the output of a linear system, computation of noise power, signal bandwidth, transmission distortion sources.	√		√		
ILO3	Understanding analog signal digitization through the study of PCM system	Capability of designing PCM system and choosing its parameters to ensure the required quality. Knowing how to compute PCM performance	√		√		

		estimation and bitrate					
ILO4	Understanding Baseband transmission, channel bandwidth requirements, error rate estimation.	Knowing how to chooses the best signals in baseband transmission, the required bandwidth to send binary and multilevel signals, capability of computing bit error rate and scrambling the bits.	√		√		
ILO5	Understanding Digital modulation	Capability of comparing basic digital modulation methods, and capability of computation of bandwidth and modulation efficiency	√		√		
ILO6	Computing information given by a discrete source, channel capacity and data compactness	Capability of Computing a coding efficiency and using some data compactness methods and computing the theoretical maximum transmission bit rate on a described channel	☐		☐		

ILO7	Knowing type of digital transmission, error detection and correction	Capability of using some types of error detection and correction methods and computing their number of detectable and correctable bits.	√		√		

7-Practice Tools:

Tool Name	Description
Course Name	

8-Main References

- اتصالات المعطيات والحواسيب من منشورات الجمعية العلمية السورية للمعلوماتية
- **Data and computer communication by W. Stalling**

9-Additional References

- الإشارات والنظم ، من منشورات جامعة دمشق– كلية المعلوماتية
- الاتصالات الرقمية، من منشورات جامعة دمشق– كلية المعلوماتية
- **Communication systems, by Haykin**