



**MUTAH UNIVERSITY**  
**Faculty of Engineering**  
**Department of Electrical Engineering**



**Course Syllabus**

Course Code	Course Name	Credits	Contact Hours
0401523	Digital Communications & Communication Systems Lab	1	2 T

**INSTRUCTOR/COORDINATOR**

<b>Name</b>	Dr. Rula Alrawashdeh
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<b>Office Hours</b>	14:00-17:00 (Mon)

**TEXTBOOK**

<b>Title</b>	Lab Sheets
<b>Author/Year/Edition</b>	
<b>Other Supplemental Materials</b>	
<b>Title</b>	
<b>Author/Year/Edition</b>	

**SPECIFIC COURSE INFORMATION**

**A. Brief Description of the Content of the Course (Catalog Description)**

This laboratory is important for engineers wishing to emphasize the communications area. This course provides practical hands-on exposure to digital communication system building blocks, such as sampling, PCM and digital modulators, and enables students to study the effects of noise on communication systems. Communications is a highly important and growing field and students should have opportunity to gain familiarity with communication test equipment and measurement techniques.

**B. Pre-requisites (P) or Co-requisites (C)**

Communication Systems (0401522) (P)

**C. Course Type (Required or Elective)**

Required

## SPECIFIC GOALS

### A. Course Learning Outcomes (CLOs)

By the end of this course, the student should be able to:

**CLO1:** Understand basic theories of Digital communication system in practical with the ability of visualization and practical implementation of Sampling, Quantization, and coding [6].

**CLO2:** Analyze and implement analogue to digital converters like PCM, DM [6].

**CLO3:** Demonstrate an understanding of Digital Modulation and demodulation schemes (ASK, FSK, PSK and DM) [6].

**CLO4:** Demonstrate an understanding of the relation between channel capacity, probability of error and signal to noise ratio and bandwidth [6].

**CLO5:** Work effectively in groups by sharing responsibilities and collaborating on findings [5].

### B. Student Learning Outcomes (SOs) Addressed by the Course

1	2	3	4	5	6	7
				✓	✓	

## BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Experiment 1: Pulse Modulation Trainer Familiarization.	1	2
Experiment 2: Sampling and signal reconstruction	1	2
Experiment 3: Pulse Amplitude Modulation Principles (PAM)	1	2
Experiment 4: Two-Channel (TDM) of PAM signals	1	2
Experiment 5: Pulse-Code Modulation Trainer Familiarization.	1	2
Experiment 6: Pulse-Code Modulation Encoding Process.	1	2
Experiment 7: Pulse-Code Modulation Decoding Process	1	2
Experiment 8: Delta Modulation Familiarization.	1	2
Experiment 9: The Delta Modulation Encoding Process.	1	2
Experiment 10: The Delta Modulation Decoding Process	1	2
Experiment 11: Digital Modulation Trainer Familiarization.	1	2
Experiment 12: Principles of Frequency Shift Keying.	1	2
Experiment 13: Principles of amplitude shift and phase shift keying.	1	2
Experiment 14: Principles of carrier synchronization for ASK and PSK signals	1	2
<b>Total</b>	<b>14</b>	<b>28</b>

<b>EVALUATION</b>		
<b>Assessment Tool</b>	<b>Due Date</b>	<b>Weight (%)</b>
Reports	After each experiment	40
Course Work (Homeworks, Quizzes, Projects, ...etc.)	One week after being assigned	20
Final Exam	According to the university calendar	40

<b>ABET's Students Learning Outcomes (Criterion # 3)</b>		
	<b>Relationship to program outcomes</b>	
<b>ABET 1-7</b>	<b>Engineering Student Outcomes</b>	
1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	
2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	
3	an ability to communicate effectively with a range of audiences.	
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
5	√	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6	√	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7		an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.