



MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering



Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401323	Communications Principles	3	3 T

INSTRUCTOR/COORDINATOR

Name	Dr. Saif Alnawayseh
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Office Hours	12:30-14:00 (Mon,Wed)

TEXTBOOK

Title	Principles of communication : systems, modulation, and noise
Author/Year/Edition	Rodger E. Ziemer. William H. Tranter/2010/Seventh edition

Other Supplemental Materials

Title	Digital & Analog Communication Systems
Author/Year/Edition	Leon W. Couch/2010/8th edition

SPECIFIC COURSE INFORMATION

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

This course introduces fundamental concepts of communication systems, which are essential for the understanding communication systems in general. The course will also cover several important modulation techniques such as Amplitude Modulation, Frequency Modulation, Phase Modulation. Also, this course introduces concept of communication in power networks through the use of power line carrier communication PLCC and the importance of communication applications in smart grid systems.

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

Signals and Systems (0401208) (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 the concepts of the analog modulations - Study the different types of Amplitude modulations, Study the generation and detection of the Amplitude modulated signals, and Analyze the Amplitude modulated signals in the time and frequency domain [1].

CLO2: Understand the concepts of the Angle modulation and Study the different types of the Angle Modulations and Study the generation and detection of the Angle modulated signals. Also, understand the difference between the Narrowband and Wideband FM in the time and frequency Domain [1].

CLO3: Understand the concepts of the noise, their Sources, types, and effects. also, to Study the main concepts of the SNR and Noise figure equivalent temperature, Performance evaluation of communication systems in the presence of noise [1].

CLO4: Understand the concept and the function of power line carrier communication technology and the use of communication technology in smart grid power networks [1].

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

1	2	3	4	5	6	7
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BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Chapter 1: Introduction to Communication Systems : Evolution of Communication System, Elements of Communication systems, Types of electronic communications, Baseband signals and baseband transmission, Modulation techniques, Bandwidth requirements	1	3
Chapter 2: Amplitude Modulation: Introduction, Equation of AM signal, Modulation index and percentage of modulation for sinusoidal AM, Frequency spectrum of the AM wave, Representation of AM wave, Average power for sinusoidal AM wave, Single Sideband Modulation: Introduction, Suppression of carrier, Suppression of unwanted sideband, Extensions	4	12
Chapter 3: Frequency Modulation: Frequency modulation theory, Characteristic of frequency modulation, Mathematical representation of frequency modulated wave, Frequency modulators, Pre-emphasis, De-emphasis, Directly modulated FM transmitter, Phase modulation, Indirect method of FM modulation, Wide and narrow band FM transmission, Advantages and disadvantages of FM, Comparison of FM and AM system, Comparison of FM and PM system	4	12
Chapter 4: Noise in Analog Modulation Systems	1	3
Chapter 5: power line carrier communication (PLCC)	2	6
Chapter 6: smart grid communication	2	6
Total	14	42

EVALUATION

Assessment Tool	Due Date	Weight (%)
Mid Exam	According to the university calendar	30
Course Work (Homeworks, Quizzes, Projects, ...etc.)	One week after being assigned	20
Final Exam	According to the university calendar	50

ABET's Students Learning Outcomes (Criterion # 3)		
Relationship to program outcomes		
ABET 1-7		Engineering Student Outcomes
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.