MUTAH UNIVERSITY
Faculty of Engineering
Department of Electrical Engineering

Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0401524	Digital Signal Processing	3	3 T

INSTRUCTOR/COORDINATOR	
Name	Dr. Amneh Al-Mbaideen
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Office Hours	13:00-14:00 (Sun, Tues, Thur)

TEXTBOOK	
Title	"Discrete-Time Signal Processing", Alan Oppenheim and Ronald Schafer with John Buck, 2nd Edition. Prentice Hall 1999.
Other Supplemental Materials	
Title	1. "Digital Signal Processing Using MATLAB",V. Ingle and J. Proakis, 3rd edition, Cengage Learning, 2012. 2. " Digital Signal Processing", J. Proakis and D. Manolakis4th edition Prentice Hall, 2006. 3. "Digital Signal Processing, A Computer-Based Approach", Sanjit K. Mitra, 4th edition, McGraw Hill, 2011. 4. "Digital Signal Processing: A Practical Approach", Emmanuel C. Ifeachor , Barrie W. Jervis , Addison-Wesley (June 1, 1993) 5. "Digital Signal Processing in Modern Communication Systems" , Andreas Schwarzinger, 1'st edition, Andreas Schwarzinger, 2013.

SPECIFIC COURSE INFORMATION

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

This course provides a fast revision of discrete-time signals and systems and Z-transforms. It also introduces digital signal processing operations, including sampling/reconstruction of continuous-time signals, The discrete Fourier transform (DFT), and fast Fourier transform (FFT). We will examine time and frequency domain techniques for designing and applying infinite impulse response (IIR) and finite impulse response (FIR) digital filters. Digital filter networks

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)

CLO1: Classify signals and systems and Analyze the discrete linear time-invariant systems in the time domain [1].
CLO2: Use the Fourier transform to evaluate and sketch the magnitude and phase spectrum of signals [1].
CLO3: Understand the basics of the Z-transform in signals and systems analysis [1].
CLO4:Nyquist sampling theorem in DSP [1].
CLO5:Understand the concepts of digital filters [1].
CLO6: Design Finite impulse response (FIR) and infinite impulse response (IIR) digital filters utilizing the FFT and Z transforms [2].

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
Chapter 2: Discrete-Time Signals and systems	1	3
Chapter 3: The Z-transform	2	6

Chapter 4: Sampling of continuous-time signals	2	6
Chapter 4: Changing the Sampling Rate Using Discrete-time Processing	1	3
Chapter 5: Transform Analysis of Linear Time-Invariant Systems	2	6
Chapter 7: Filter Design Techniques: IIR filters and FIR filters	3	9
Chapter 8+9: The Discrete Fourier Transform	1	3
Chapter 10: Decimation-in-time FFT Algorithms	1	3
Handouts: Applications of DSP	1	3
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.