Jordan University of Science and Technology

Faculty of Engineering

Biomedical Engineering Department

BME421 Digital Signal Processing

First Semester 2023-2024

Course Catalog
3 Credit Hours. 3 Credit hours (3 h lectures).The basics of discrete sequences, studying the terms Linearity, Time-invariance, Causality, and Stability, Fourier transform theorems, Z-transform, the sampling theorem and the Nyquist rate, complete (A/D ? DSP ? D/A) system in both time and the frequency domains, frequency response of linear time invariant systems, frequency selective filters and Phase Distortion and Delay, IIR and FIR systems, design of different types of digital filters, bilinear transformation, and MATLAB use in designing different types of analog and digital filters, introduction to adaptive filters

Text Book	
Title	Discrete-time Signal Processing
Author(s)	Oppenheim A. and Schafer R.
Edition	2nd Edition
Short Name	Ref #1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Biomedical Signal Processing and Signal Modeling	John Wiley and Sons	3rd Edition	

Instructor	
Name	**Prof. Luay Fraiwan**
Office Location	C5 L2
Office Hours	
Email	fraiwan@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Tue : 10:30 - 11:30 Room: C5020

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
283212	BME321 Biomedical Signals And Systems	Prerequisite / Pass

Tentative List of Topics Covered		
Weeks	**Topic**	**References**
Week 1	Introduction	
Weeks 2, 3	Discrete time signals and systems	
Weeks 4, 5	The z-transform	
Weeks 6, 7, 8	Sampling of continuous time signals	
Weeks 9, 10	Transform analysis of LTI systems	
Week 11	Structures for discrete time systems	
Weeks 12, 13	Digital filter design techniques	
Weeks 14, 15	Analog filter design and A/D transformation	

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understanding the basics of discrete sequences [1SO1]	5%	
Understanding the terms Linearity, Time invariance, Causality, and Stability [1SO1]	5%	
Understanding the Fourier Transform theorems [1SO1]	10%	
Understanding the Z- transform and its region of convergence [1SO1]	10%	
Understanding the sampling theorem and the signal Nyquist rate [1SO1]	10%	
Understanding the complete (A/D ? DSP ? D/A) system [1SO1]	10%	
Being able to deal with the complete (A/D ? DSP ?D/A) system in both time and frequency domains [1SO1]	10%	
Being able to evaluate the frequency response of Linear Time Invariant systems [1SO1]	10%	
Understand the frequency selective filters and phase distortion and delay [1SO1]	10%	
Understand the FIR and finite or not IIR systems [1SO1]	10%	

Being able to design different types of digital filters [1SO2, 1SO6]	5%	
Being able to design different types of analog filters and perform bilinear transformation to obtain the equivalent digital filter [1SO2, 1SO6]	5%	

Relationship to Program Student Outcomes (Out of 100%)						
SO1	SO2	SO3	SO4	SO5	SO6	SO7
90	5				5	

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