Jordan University of Science and Technology

Faculty of Engineering

Biomedical Engineering Department

BME321 Biomedical Signals And Systems

Summer Semester 2019-2020

Course Catalog
3 Credit Hours. Concepts of linear time invariant systems; discrete and continuous time systems; application of Laplace and Fourier transforms to linear systems; Z-transform; system function; frequency response and simulation in the frequency domain; discrete Fourier series and fast Fourier transform; computer applications.

Text Book	
Title	Signals and Systems
Author(s)	Oppenheim, A.V., Willsky, A.S. and Young, I.A
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	Bruce, E.N.	2nd Edition	

Instructor	
Name	**Dr. Khaldon Lweesy**
Office Location	C5 L2
Office Hours	
Email	klweesy@just.edu.jo

Class Schedule & Room
Section 1: Lecture Time: Sun, Mon, Tue, Wed : 14:30 - 16:00 Room: منصة الكترونية

Prerequisites		
Line Number	**Course Name**	**Prerequisite Type**
282040	BME204 Introduction To Linear Systems	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	**Topic**	**References**

Week 1	Introduction: Modeling, CT and DT physical systems, Matlab	
Week 2	Continuous Time (CT) Signals and Systems: Transformations, Signal Characteristics, Special functions, Functions, CT systems, Properties of CT times.	
Weeks 3, 4	CT Linear Time Invariant Systems: Impulse representation of CT Signals, Convolution and its properties, Differential equation models, Natural systems. System response for complex-exponential inputs.	
Weeks 5, 6	Fourier Series: Periodic functions, Fourier series, Fourier Coefficients, Frequency Spectra, Properties of Fourier Series, System analysis.	
Weeks 7, 8	The Fourier Transform: Definition, Properties, Fourier Transform of Time Functions, Sampling, Applications, Energy and power spectra.	
Weeks 9, 10	The Laplace Transform: Definitions, Examples, Properties, Response of LTI Systems and Its characteristics	
Weeks 11, 12	Discrete ? Time Signals and Systems	
Week 13	DT linear invariant systems	
Week 14	Fourier Transform of DT Signals Definition and properties	
Weeks 15, 16	The Z-Transform: Definition and properties	

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Understand the linear system theory [1A, 1B, 1C, 1E, 1I, 1K, 1L, 1M]	12%	
Understand the basic properties of signals and systems [1A, 1B, 1C, 1E, 1I, 1K, 1L, 1M]	12%	
Understand the modeling of signals in different domain [1A, 1B, 1C, 1E, 1I, 1K, 1L, 1M]	12%	
Understand the frequency domain analysis [1A, 1B, 1C, 1E, 1I, 1K, 1L, 1M]	12%	
Learn how to discretize medical signals and understand the discrete time systems [1A, 1B, 1C, 1E, 1I, 1K, 1L, 1M]	12%	
Apply the above principles is processing biomedical signals [1A, 1B, 1C, 1E, 1I, 1K, 1L, 1M]	12%	
Learn How to use Data acquisition to record signals [1A, 1B, 1C, 1E, 1I, 1K, 1L, 1M]	12%	
Learn How to use Matlab to show Bio signals [1A, 1B, 1C, 1E, 1G, 1I, 1K, 1L, 1M]	16%	

Relationship to Program Student Outcomes (Out of 100%)																			
A	B	C	D	E	F	G	H	I	J	K	L	M	SLO1	SLO2	SLO3	SLO4	SLO5	SLO6	SLO7
12.28	12.28	12.28		12.28		1.78		12.28		12.28	12.28	12.28							

Evaluation	
Assessment Tool	**Weight**
First Exam	25%
Second Exam	25%
Homeworks and Quizzes	10%
Final Exam	40%