The University of Jordan
School of Engineering
Electrical Engineering Department
2nd Semester – A.Y. 2020/2021

Course:	**Digital Signal Processing – 0943424 (3 Cr. – Required Course)**
Instructor:	Prof. Dia Abu-Al-Nadi Office: E306, Telephone: 06/5355000 ext 22857, Email: dnadi@ju.edu.jo Office Hours: Will be posted soon
Course website:	http://elearning.ju.edu.jo/
Catalog description:	Introduction to Digital Signal Processing (DSP). Discrete time signals and systems. Z-transform. Modeling and implementation forms of discrete time systems. Time and frequency domain analysis of digital processors. Design and analysis of finite impulse response filters (FIR). Analog filter approximations. Design and analysis of infinite impulse response (IIR) filters. Digital filter networks. Digital equalizers. The DFT and FFT algorithms. DSP algorithms and applications.
Prerequisites by course:	**EE** **0953321** Probability and Random Variables (pre-requisite)
Prerequisites by topic:	Students are assumed to have a background in the following topics: • Continuous and discrete-time signals and systems analysis techniques. • Fourier series and transform. • Basics of using MATLAB.
Textbook:	**Digital Signal Processing: A Computer-Based Approach by Sanjit K. Mitra, 4th Edition, McGraw-Hill Education, 2011.**
References:	1. Understanding Digital Signal Processing by Richard G. Lyons, 3rd Edition, Prentice Hall, 2011. 2. Digital Signal Processing by John G. Proakis and Dimitris K Manolakis, 4th edition, Pearson, 2006. 3. Digital Signal Processing with Examples in MATLAB by Samuel D. Stearns and Donald R. Hush, 2nd edition, CRC Press, 2011. 4. Digital Signal Processing: Fundamentals and Applications by Lizhe Tan and Jean Jiang, 2nd edition, Academic Press, 2013. 5. Discrete-Time Signal Processing by Alan V. Oppenheim and Ronald W. Schafer, Pearson, 3rd Edition, 2009. 6. Digital Signal Processing in Modern Communication Systems by Andreas Schwarzinger, Independent Publishing, 1st Edition, 2013. 7. Schaums Outline of Digital Signal Processing by Monson H. Hayes, McGraw-Hill Education, 2nd edition, 2011.

8. Introduction to Digital Signal Processing by Dick Blandford and John Parr, Pearson, 1 edition, 2012.

Schedule: 16 Weeks, 42 lectures (50 minutes each) plus exams.

Course goals: The overall objective is to provide the student with the knowledge and proficiency in discrete time signal analysis and also the design of digital infinite impulse response (IIR) and finite impulse response (FIR) filters.

Course learning outcomes (CLO) and relation to ABET student outcomes (SO):

Upon successful completion of this course, a student will:		[SO]
1.	Be able to represent signals and systems on digital computers.	[1]
2.	Be able to analyze discrete time signals and systems.	[1]
3.	Use transforms to analyze and design discrete time signals and systems.	[1]
4.	Be able to process and manipulate discrete time signals on digital computers.	[1]
5.	Be able to design and test discrete time systems and filters on digital computers.	[1, 2]

Course topics:		Hrs
1.	Signals and signal processing.	4
2.	Discrete-time signals in the time domain.	5
3.	Discrete-time systems.	5
4.	Discrete-time signals and systems in the frequency domain.	4
5.	Finite-length transforms.	4
6.	The z-transform.	6
7.	Analog filter design.	4
8.	The infinite impulse response (IIR) digital filter design.	5
9.	The finite impulse response (FIR) digital filter design.	5

Ground rules: Attendance is required and highly encouraged. To that end, attendance will be taken every lecture. Eating and drinking are not allowed during class, and cell phones must be set to silent mode. All exams (including the final exam) should be considered cumulative. Exams are closed book. No scratch paper is allowed. You will be held responsible for all reading material assigned, even if it is not explicitly covered in lecture notes.

Assessment & grading policy:

Assignments	0%	Quizzes	0%
First Exam	15%	Projects	15%
Midterm Exam	30%	Lab Reports	0%
Final Exam	40%	Presentation	0%
		Total	**100%**

Last Revised: March 2021