

**King Saud University**  
**College of Computer and Information Sciences**  
**Department of Computer Engineering**

**CEN 543 – Digital Signal Processing (3-0-0), Masters Course**

**Semester I, Academic Year 2018-2019**  
**Lecture Time and Place: Thursday 8 – 10:30 AM**

**Course Description (catalog):**

Review of linear time invariant systems, discrete time signals, discrete Fourier transforms (DFT), fast Fourier transforms (FFT), Z-transforms, design of finite impulse response (FIR) filter and infinite impulse response (IIR) filter, adaptive filters, application on audio and image processing.

**Course objectives**

Students completing the course can have a deep understanding of digital signal processing and its application on audio and image processing.

**Textbook(s) and/or Other Required Materials:**

**Primary:**

- V. Oppenheim and R. W. Schaffer, *Discrete-Time Signal Processing*, Third Edition, 2010, Prentice Hall.

**Supplementary:**

- Li Tan, *Digital Signal Processing: Fundamentals and Applications*, 2008, AP, Elsevier.
- Steven W. Smith, *The Scientist and Engineer's Guide to Digital Signal Processing*, 1997, California Technical Publishing

**Course Learning Objectives:**

This course is designed to help the student:

- 1) Realize sampling and quantization.
- 2) Perform time-domain operations on discrete time signals.
- 3) Analyze signals using DFT and FFT.
- 4) Analyze signals using Z-transform.
- 5) Design and implement digital filters.
- 6) Apply filters in audio and image signal processing.

**Grading:**

**Project:..... 20%**  
**HW:.....20%**  
**Mid-Exam:.....20%**  
**Final Exam:.....40%**

**Course Policies:**

- **No late** homework submission will be accepted.
- Homework submission should be hardcopy.
- There will be no relative grading.
- Students are encouraged to discuss homework problems but **not copy**

**Exams:**

- Mid-term Exam .....1 Nov. 2018
- Final Exam .....9 Dec 2018.