Signals and Systems II - Course Syllabus

Course Number: EE 152

Course Title: Signals and Systems II

Academic Semester: Spring   **Academic Year:** 2015/ 2016
Semester Start Date: Jan, 24, 2016   **Semester End Date:** May, 19, 2016

Class Schedule: Monday and Thursday from 02:30 PM to 04:00 PM

Classroom Number:

Instructor(s) Name(s):   Ahmed Kamal Sultan Salem
Email: ahmed.salem@kaust.edu.sa

Office Location: 3110 Khawarizmi West

COMPREHENSIVE COURSE DESCRIPTION

Pre-requisites: EE151. This course builds upon the material investigated in EE 151 (Signals and Systems I) and addresses the following topics: z-transform, sampling and quantization, continuous-time filters, digital filters, finite impulse response (FIR) filter design, infinite impulse response (IIR) filter design, and applications of digital signal processing.

GOALS AND OBJECTIVES

At the end of this course, students should:

1. Understand the z-transform and how it is applied to discrete-time systems.

2. Understand the properties of the z-transform and how it is related to the discrete-time Fourier transform (DTFT).

3. Understand the class of bandlimited signals and their properties.

4. Understand the sampling of continuous-time signals and the conditions needed for perfect reconstruction.

5. Understand the quantization of signals and be able to analyse the associated quantization error.

6. Understand the operation of continuous- and discrete-time filters.

7. Understand the mathematics underlying filter design, e.g. chebyshev polynomials.

8. Be able to design continuous-time filters.

9. Be able to design finite impulse response (FIR) and infinite impulse response (IIR) discrete-time filters.

10. Understand filtering in the context of some applications such as analog-to-digital and digital-to-analog conversion.

REQUIRED KNOWLEDGE

- Fourier analysis (Fourier series, continuous-time Fourier transform, discrete-time Fourier transform)

- Linear time-invariant system theory

- Calculus

REFERENCE TEXTS

• *Required Textbook:*

Continuous and Discrete Time Signals and Systems by Mrinal Mandal, Amir Asif

• *Reference Books:*

* Signals and Systems (2nd Edition) by Alan V. Oppenheim, Alan S. Willsky with S. Hamid

* Signals and Systems using MATLAB (2nd Edition) by Luis Chaparro

* Transforms in Signals and Systems by Peter Kraniauskas

METHOD OF EVALUATION

- **30 %**   **Problem sets + Matlab**
- **30 %**   **Midterm Exam**
- **40 %**   **Final exam**

COURSE REQUIREMENTS

Assignments

8 to 10 problem sets. Students are required to solve about 6 problems weekly.

Course Policies (Absences, Assignments, late work policy, etc.)

Late submissions are not accepted.

NOTE : The instructor reserves the right to make changes to this syllabus as necessary.