EECE 4510/5510 – Digital Signal Processing
Fred J. Frigo, Ph.D.
Fall 2023

Course Description:
Introduction to the theory and practice of discrete-time signals and systems. Concepts covered include Fourier Transforms, Z-transforms, linear time invariant system analysis in the time and frequency domains, sampling theory and Discrete Fourier Transforms. Application of these concepts includes digital filter design techniques and the use of Fast Fourier Transforms for efficient frequency domain analysis. Labs and design projects related to specific signal processing applications are used to illustrate the material, including topics such as audio and image processing.

Additional Details:
Simple examples using MATLAB, C/C++ and CUDA will be used to demonstrate key concepts of the course. Example source code will be shared from the class GitHub repository, and students will have access to the necessary hardware and software for implementation. Class notes and lecture recordings will be shared on D2L. Assignments will be given at least 2 weeks prior to the due date.

Location & Schedule:
Class meets in EHALL 328 on Mondays & Wednesdays: 5:00pm-6:15pm

Grading:
Homework and Projects: 60%
Mid-term exam: 20%
Final exam: 20%

Recommended Texts:

Alan V. Oppenheim, Ronald W. Schafer, *Discrete-Time Signal Processing,* 3rd edition*, 2010.*
ISBN-13: 978-0131988422
ISBN-10: 0131988425

Dick Blandford, John Parr, *Introduction to Digital Signal Processing,* 1st edition*, 2013.*
ISBN-13: 978-0131394063
ISBN-10: 0131394061

Other Notes:
Students are required to comply with all policies outlined in the Undergraduate/Graduate Bulletin, including the Marquette University Honor Code and Honor Policy. Attendance is required. Excessive unexcused absences may result in grade of 'WA' or 'WF'.

Office Hours:
By appointment; using Microsoft Teams or in-person Haggerty Hall – Room 235

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