EE 60671: Advanced Digital Processing
Fall 2021

Instructor: Prof. Ken Sauer
Office: Fitzpatrick 272 Phone: 631-6999, E-mail:sauer@nd.edu
Office hrs.: Open
Lecture: TR, 3:30 - 4:45 PM, 102 Pasquerilla Center
Homework: 7-10 assignments during semester
Grading: 35% final exam, 30% midterm, 20% homework, 15% project
Web site: https://www.nd.edu/~sauer/DSP2

Tentative Course Outline

1. **Review of Basic DSP (Chapters 1-5, 7)**
   Orthogonal representation of discrete-time (DT) signals; DT systems & difference equations; z-transforms; Fourier transforms; DFT properties

2. **Random signals, Sampling and A/D, D/A (Chapter 6, Section 12.1)**

3. **Implementation and Design of DT Systems (Chapters 9-10)**

4. **Multirate DSP (Chapter 11 & handouts)**

5. **Filtering of Random DT Signals (Chapters 12-13)**

6. **Power Spectrum Estimation (Chapter 14)**

Miscellaneous Comments

- Though we begin with a review of basic DSP concepts, this will be a relatively brief treatment. We will assume you have had a thorough undergraduate-level course on signals and systems, and preferably, on DSP. Our text is often used for DSP I as well, so anything missing in your background should be available in sections we omit from this course. You may also find some more basic DSP texts are helpful in refreshing your memory.

- The project will be independent study on a DSP topic of your choice, with written reports due during the last two weeks of the semester. You will be required to find a current research paper(s) on the topic and perform some combination of analysis and simulation of the proposed methods. Time permitting, oral reports will be held in class at the end of the semester.

- Office hours are given as “open,” meaning they are not restricted to pre-set times. Students may drop in whenever they have a question, with the understanding that I may not always be in, or may not have a lot of time at the moment when you happen to appear. It is probably worth your while to e-mail to see whether I’m available. Zoom meetings are also possible and, in fact, preferred if COVID infection rates remain high.