# Introduction to Digital Signal Processing

*ECE 4670 and 6670  Summer 2020*

*http://cs.clemson.edu/~ekp/courses/ece6670*

## COURSE DESCRIPTION

Introduction to characteristics, design, and applications of discrete-time systems; design of digital filters; introduction to the Fast Fourier Transform (FFT); signal-processing applications.
Preq: ECE 3300 (or equivalent) with a C or better.

## CONTACT

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Class:  17:00-18:15 T Th
        May 12 - July 28
        excluding June 15-19
        106 ZGEC
        223 Riggs

## TEXT

*Understanding Digital Signal Processing*, 3rd ed., by Richard G. Lyons.

## GRADING

| | |
|---|---|
| Test 1 | 20% |
| Test 2 | 20% |
| Assignments | 40% |
| Final Exam | 20% |

## GRADING SCALE

A: 90-100
B: 80-89
C: 70-79
D: 60-69
F: 0-59

Final exam is scheduled for 15:00-17:30 Friday, July 31.

Course delivery consists of elements of in-person, synchronous, or asynchronous content along with text reading.  Assignments consist of mathematical and design exercises by hand as well as software development that may include platforms such as Python, Arduino, or MATLAB.  Specific instructions are given during class.

## COURSE TOPICS

I.   Discrete Sequences and Systems
II.  Periodic Sampling
III. Discrete Fourier Transform
IV.  Fast Fourier transform
V.   Finite Impulse Response Filters
VI.  Infinite Impulse Response Filters
VII. Application Examples

## LEARNING OUTCOMES

1.  Understanding of fundamentals of discrete-time systems and digital signal processing.
2.  Application and understanding of the Discrete Fourier Transform.
3.  Design and analysis of digital filters.
4.  Software implementation and analysis of transforms and filters.
5.  Understanding of basic applications of digital signal processing.

The graduate section 6670 has additional expectations in regard to the depth of outcomes 4 and 5, completing additional design and implementation work and studying a practical DSP system or research application.

## CLASS POLICIES

A variety of Internet-based tools such as the course website, Canvas, WebEx Teams, or other similar software will be used for class content and communication, specified as needed at the start and during the course.

Students are individually responsible for keeping current with course material and assignments. Late assignments are not accepted.

Class announcements supersede posted material.
Academic honesty in all your work is required for a passing grade.

## BOILERPLATE

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a 'high seminary of learning.' Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. In instances where academic standards may have been compromised, Clemson University has a responsibility to respond appropriately to charges of violations of academic integrity.

It is university policy to provide, on a flexible and individualized basis, reasonable accommodations to students who have disabilities. Students requesting accommodations should make an appointment with Student Accessibility Services to discuss specific needs within the first week of classes. Students should present a Faculty Accommodation Letter when they meet with instructors. Accommodations are not retroactive and new Faculty Accommodation Letters must be presented each semester.

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