

# EEE5109 Digital Signal Processing

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## Summary

This course will introduce the student to digital signal processing systems which have become key components in most electronic devices. Material from this course will allow the student to design and implement DSP systems such as those used in speech processing and communication systems.

## Course content

1. Introduction to discrete time signals and systems
2. Discrete time system properties
3. Linear time invariant (LTI) systems
4. Frequency-domain representation of discrete time systems
5.  $z$ -transform
6. Sampling of continuous time signals
7. Filter design
8. The discrete Fourier transform

## Prerequisites

It is assumed that the student is familiar with integral and differential calculus, complex numbers, Fourier series, signals and systems theory. Some computer programming experience is also assumed. A number of programming assignments will be given during the course. For these assignments the student may use any language but Matlab and Python may prove to be the most useful.

## Course books

I will use the following books as references:

1. Alan V. Oppenheim and Ronald W. Shafer *Discrete-Time Signal Processing*, 2nd edition, Prentice Hall
2. Simon Haykin and Barry Van Veen, *Signals and Systems*, 2nd edition, John Wiley and Sons.

The following books are available in the library and will serve as useful references.

1. Proakis John G. *Digital Signal processing : Principles, Algorithms and Applications*. New Jersey : Prentice Hall, 2007.
2. Mitra, Sanjit K. *Digital Signal processing : A computer based approach*. Boston, Burr Ridge : Mc Graw Hill, 2006.
3. Blanchet, Gerard, *Digital signal and image processing using MATLAB* London : ISTE, 2006.

## Assessment

There will be two continuous assesment tests during the semester (during the 8th and 11th weeks) and a final exam. The dates will be announced at a later date. Also, regular homework will be assigned. **Academic Honesty** is expected. Any work handed in must be your own. Discussion among students is encouraged but answers must be written up individually.

## Office hours

By appointment