Outline

Objectives

After finishing the course students should be able to

- Demonstrate knowledge of digital signal processing techniques;
- Solve and analyze digital signal processing problems;
- Design systems using knowledge obtained from the course;
- Apply knowledge to other related topics.

Course Description

- Time-varying signals
- Z-transformation
- Discrete Fourier Transformation
- Fourier Analysis for Time-varying signals
- Digital filter design
- Random signals
- Power spectrum estimation

Text Books

Primary Texts:

P.A. Lynn and W. Fuerst	Introductory Digital Signal Processing	John Wiley
J.G. Proakis and D. G. Manolakis	Digital Signal Processing Principles, Algorithms and Applications	Pearson Education

Other:

E.C. Ifeacher and B.W. Jervis	Digital Signal Processing A Practical Approach	Addison-Wesley
J. Van de Vegte	Fundamentals of Digital Signal Processing	Prentice Hall

What is Digital Signal Processing?

Techniques include (*e.g.*)

- Filtering
- Frequency domain techniques (*i.e.* Fourier)
- Time domain techniques
- Random signals
- Predication and Estimation (*e.g.* time series estimation)

Example Applications

- Audio processing
- Communication systems
- Image processing
- Video processing
- Data compression
- Vehicle control
- Financial engineering