TEL 311E – Digital Signal Processing

Fall 2010

Instructor :	İlker Bayram EEB 1103 ibayram@itu.edu.tr

Class Meets :	13.30 – 16.30, Monday EEB, Devreler ve Sistemler Seminer Odası (next to 2311)
Office Hours :	10.00 – 12.00, Monday
Textbook :	A. V. Oppenheim, R. W. Schafer and J. R. Buck, 'Discrete-Time Signal Processing', 2^{nd} Edition, Prentice Hall.
Grading :	Homeworks (10% total), 2 Midterms (20% each), Final (50%).

Tentative Course Outline

1. Discrete-Time Signals and Systems
    - Basic Sequences (2.1)
    - Properties of Discrete-Time Systems (2.2)
    - Linear Time-Invariant (LTI) Systems (2.3, 2.4)
    - Discrete-Time Fourier Transform (DTFT) (2.6 – 2.9)
2. The z-Transform
    - Definition, Region of Convergence (3.1, 3.2)
    - Inverse z-Transform (3.3)
    - Properties of the z-Transform (3.4)
3. Sampling
    - Sampling of Continuous-Time Signals (4.1, 4.2)
    - Reconstruction from Samples (4.3)
    - Discrete-Time Processing of Continuous-Time Signals (4.4)
    - Changing the Sampling Rate (4.6)
4. Linear Time-Invariant Systems
    - Frequency Response of LTI Systems (5.1)
    - Linear Constant Coefficient Difference Equations (5.2)
    - Frequency Response of Rational Systems (5.3)
    - Magnitude and Phase (5.4)
5. Discrete Fourier Transform

- Discrete Fourier Series (8.1, 8.2)
- Relation with the Fourier Transform (8.3,8.4)
- Discrete Fourier Transform (8.5, 8.6, 8.7)
- Fast Fourier Transform (9.3)

6. Filter Design

- Impulse Invariance (7.1)
- Bilinear Transformation (7.1)
- Windowing (7.2)