

ECE 521: Digital Signals and Filters – Fall 2011

TTh 5:00–6:20 PM, SEC–206

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Instructor

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Office Hours: T 10 AM–Noon and 6:30–7:30 PM

Required Text

Alan V. Oppenheim and Ronald W. Schaffer, *Discrete-Time Signal Processing*, Prentice Hall (3rd ed.)

Prerequisites

Registered students should ideally have taken ECE 345 (Linear Signals and Systems) and ECE 346 (Digital Signal Processing) or equivalent courses at other universities. Students who have not taken such courses should talk to me after the first lecture. In general, it is expected that students are at the very least familiar with MATLAB and the basic concepts of Chapter 2 of Oppenheim and Schaffer.

Course Outline

- Chapter 4: *Sampling of bandlimited signals, anti-aliasing filters, reconstruction filters, etc.*
- Chapters 8–10: *Discrete Fourier transform, fast Fourier transform, analysis of signals using DFT, etc.*
- Chapters 3, 5–6: *z-transform, analysis and representation of LTI systems, IIR and FIR filter design*
- Advanced Topics (if time permits): *Noise and quantization effects in DSP systems, transform coding of signals for compression and noise reduction*

Course Requirements

The final course grade will be based upon:

1. Weekly assignments (10%)
2. Small MATLAB projects (25%)
3. In-class exam (30%)
4. Final exam (35%)

Being a graduate class, it is expected (but not required) that students turn in their assignments and projects using \LaTeX . In order to incentivize this, every assignment and project typeset in \LaTeX after October 1 would get up to an extra 10% of the graded points.