

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
ELECTRICAL ENGINEERING DEPARTMENT

EE406- DIGITAL SIGNAL PROCESSING
FALL SEMESTER 2005-2006

COURSE CONTENT:

- Discrete-Time Signals and Systems:
Classification of signals; Linear shift-invariant systems;
System response; Convolution; Stability and causality
- The z-Transform:
Definitions and region of convergence; Inverse z-transform;
Properties of the z-transform; Realization; System function;
Frequency response; Difference equations
- Discrete-Time Networks:
Signal flow graphs
Realizations forms:
Direct, cascade, and parallel forms
- Sampling and Discrete-Time Fourier Transform:
Definitions; Convergence conditions; Properties of the DTFT; Aliasing;
Analog-to-digital and digital-to-analog conversions
- Introduction to Discrete Fourier Transform:
Definitions; Properties; Efficient computation of the DFT; FFT algorithms
- Introduction to Digital Filters Design:
FIR versus IIR; Linear-phase filters;
Windowing design techniques for FIR:

PREREQUISITE: EE370

TEXT BOOK:

1. J. G. Proakis and D. G. Manolakis, *Digital Signal Processing: Principles, Algorithms and Applications*, 3rd Edition, Prentice Hall, 1996.

REFERENCES:

2. A. V. Oppenheim and W. Schaffer, *Digital-Time Signal Processing*, 4th Edition, Oxford Publishing, 1998.
3. L. B. Jackson, *Digital Filters and Signal Processing*, 3rd Edition, KAP, 1995
4. R. A. Roberts and C. T. Mullis, *Digital Signal Processing*, Addison-Wesley, 1987.

GRADING POLICY:

PROJECTS & QUIZZES: 25% **EXAM I (Oct. 18):** 20% **EXAM II (Dec 20):** 20% **FINAL EXAM:** 35%

INSTRUCTOR:

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