CENG 5131 Review for Final Exam

Review your homeworks and Previous Exams!

Always Review the Basics – complex numbers, Euler’s formula, linearity, etc.

Ch. 8 The Fourier Series and Fourier Transforms

1. **Be able to calculate the Trigonometric Fourier Series as shown in Example 8.1, page 373, Ex 8.3,page377.**
2. Be able to calculate the complex exponential series as illustrated in Example 8.5, Page 382.
3. Review Examples 8.6, and 8.7- Spectrum.
4. Be able to calculate the Fourier Transform as illustrated in Example 8.10, page 398.
5. Understand how to use the Fourier Transform to solve differential equations, page 404.
6. Understand how to use the Fourier Transform for determining the Frequency Response of Linear Time-invariant systems, page 405-406.

Ch. 9 The Laplace Transforms and the Transfer Function Representation Including Control Applications

1. Laplace definition and Review the tables of Laplace Transforms for use in applications, pages 418-423.
2. Understand the calculation of the inverse Laplace Transform using partial fraction expansion as in Examples 9.3-9.5. MATLAB examples Pages 431-434.
3. **Laplace response of differential equations as in Example 9.9, page 436.**
4. Transfer functions as in Examples pages 444-452.
5. Initial and final-value theorem pages 454-455.
6. Relation to Fourier Transform, pages 452-453.
7. **Simple Control Example using Laplace Transforms as in Last Homework**.

Chapter 10 Difference Equations and z-Transforms

1. Difference Equation solutions Section 10.1-10.2.
2. Z-transforms and Inverse z-transforms Sections 10.5
3. Z-transform solution of difference equations, Sections 10-7, p488.
4. Z-transform applications to linear systems,   
   Sections 10.7-10.9. See Example 10.13, page 489.

Chapter 11 Fourier Analysis of Discrete-Time Signals and Sampling

1. Understand the definition of the DFT (eq. 11.5)
2. Understand the computation of DFT (Example 11.7, Page 533).
3. Understand the general concepts of the FFT and why it is used.
4. Understand the sampling theorem as discussed in Section 11.4, pages 523-526. See Example 11.4 and 11.5 for sampling interval and time period.

OF COURSE, REVIEW ALL HOMEWORKS, QUIZZES AND TESTS.