CPE 381 Final Exam material

	Must Know	Should Know
Chapter 0 – Introduction	X	
0.2 Examples of signal processing applications		X
0.3, 0.4, 0.5	X	
Chapter 1 – Signals	X	
1.2, 1.3, 1.4, 1.5, 1.6	X	
Ex 1.2, 1.8, 1.9, 1.10, 1.11, 1.13, 1.14	X	
Chapter 2 – Systems	X	
2.2, 2.3, 2.3.1	X	
2.3.2		X
2.3.3	X	
2.4, 2.5, 2.6	X	
Ex. 2.1, 2.3, 2.5, 2.11,	X	
Ex. 2.10, 2.15, 2.17, 2.20		X
Chapter 3 – Laplace	X	
3.2, 3.3, 3.4, 3.5, 3.6, 3.7	X	
3.8		X
Ex. 3.1, 3.2, 3.3, 3.8, 3.12, 3.17, 3.18, 3.19, 3.24, 3.25, 3.28, 3.29	X	
Ex. 3.9, 3.23, 3.26		X

	Must Know	Should Know
Chapter 4 Fourier Series	X	
4.2 Eigenfunctions	X	
4.3 Complex exponential Fourier series	X	
4.3.6 Time and frequency shifting -- modulation	X	
4.4 Response of LTI Systems	X	
4.4.1 Filtering	X	
4.5 Operations using Fourier series	X	
Ex. 4.4, 4.5	X	
Ex. 4.1, 4.3, 4.7, 4.10, 4.14		X
Chapter 5 Fourier Transform	X	
5.2 From the Fourier series to the Fourier transform	X	
5.4 Fourier Transform from Laplace Transform	X	
5.5. Linearity, Inverse proportionality and Duality	X	
5.6 Spectral representation	X	
5.7 Convolution and Filtering	X	
5.8 Additional properties	X	
Ex. 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.16, 5.17	X	
Ex. 5.18,		X
Chapter 8 Sampling theory	X	
8.2 Uniform sampling	X	
8.2.5 Nyquist-Shannon sampling theorem	X	
8.3 Practical aspects of sampling	X	
8.4 Applications to digital communications	X	
Ex. 8.4, 8.5	X	
Ex. 8.1, 8.7		X
Chapter 9 -- Discrete-time signals and systems	X	
9.2 Discrete-time signals	X	
9.3 Discrete-time systems	X	
9.3.1 Recursive and non-recursive discrete-time systems	X	
9.3.2 Dynamic Discrete-time Systems Represented by	X	
Difference Equations	X	
Ex. 9.1, 9.3, 9.5, 9.20, 9.22, 9.23	X	

	Must Know	Should Know
Chapter 10 -- Z-transform	X	
10.2. Laplace transform of sampled signals	X	
10.3 Two-sided Z-transform		X
10.4 One-side Z-transform	X	
Ex. 10.7, 10.8, 10.9, 10.10, 10.11, **10.12**, 10.20	X	
Ex. 10.1, 10.3		X
	Must Know	Should Know
Chapter 11 -- Fourier analysis of discrete-time signals and systems	X	
11.2 Discrete-time Fourier transform	X	
11.4 Discrete Fourier transform	X	
Ex. 11.4, 11.5	X	

Additional material:

- Basic formulas
  - Arithmetic ($\sum_{n=0}^{N} n = \frac{N(N+1)}{2}$) and Geometric ($\sum_{n=0}^{N-1} a^n = \frac{1-a^N}{1-a}$) series,
  - basic trigonometric formulas
- Basic transformations
- All examples in class
- All homework/quiz solutions