

EE 301 (MWF 2:30-3:20 Section)  
Spring 2013  
Problem Set 11  
Due When Pigs Fly

“O&W” is Oppenheim and Willsky, Edition 2. The following text sections will be covered on the Final Exam (Friday May 3 from 1 – 3 PM in LILY 1105):

- O&W Chapter 1 pages 1 – 57. Key concepts: DT vs. CT signals, important types of signals, DT and CT systems, classifications of systems.
- O&W Chapter 2 pages 74 – 137. Key concepts: convolution sum (DT systems) and convolution integral (CT systems), LTI systems, difference equations (DT systems) and differential equations (CT systems).
- O&W Chapter 3 pages 177 – 211 (Sec. 3.0 – 3.5). Key concepts: LTI systems with complex exponential signal inputs, Fourier Series for CT periodic signals.
- O&W Chapter 4 pages 284 – 333. Key concepts: CTFT and properties, LTI systems via CTFT methods, finding transfer function from differential equation.
- O&W Chapter 8 pages 582 – 604 (Sec. 8.0 – 8.5). Key concepts: double sideband suppressed carrier amplitude modulation (AM) and demodulation, AM large carrier, single sideband AM, AM with pulse train carrier.
- O&W Chapter 3 pages 211 – 223 (Sec. 3.5, 3.6). Key concept: Fourier Series for DT periodic signals.
- O&W Chapter 5 pages 358 – 390, 396 – 399 (Sec. 5.0 – 5.6, 5.8). Key concepts: DTFT and properties, LTI systems via DTFT methods, finding transfer function from difference equation.
- O&W Chapter 7 pages 514 – 545 (Sec. 7.0 – 7.4). Key concepts: the sampling theorem, interpolation, DT processing of CT signals.
- O&W Chapters 9 pages 654 – 674, 682 – 692 (Sec. 9.0 – 9.3, 9.5) and 10 pages 741 – 763, 767 – 774 (Sec. 10.0 – 10.3, 10.5). Key concepts: bilateral Laplace and Z transforms, properties, and relationships to Fourier transforms and use in LTI systems.

The following problems are offered for practice. Solutions will be posted later.

1. Computing Laplace Transform: O&W 9.21 (b, d, h).
2. Computing inverse Laplace Transform: O&W 9.22 (b, d).
3. Relating system transfer function and impulse response: O&W 9.31.
4. Inverse system: O&W 9.48.
5. Computing Z-transform: O&W 10.21 (c, e).
6. Ditto above: O&W 10.22 (b).
7. Computing inverse Z-transform: O&W 10.24.
8. LTI systems, causality, and stability: O&W 10.34.