Final Exam Review Sheet

The exam will cover the following topics. You can bring one sheet of handwritten notes to the exam. No textbooks, class notes or homework solutions are allowed. You may use a calculator. The exam will be in class on Wednesday, April 30 and will be 2 hours long.

I. Linear Modulation
   - DSB modulation
     i. Spectrum, Power, Bandwidth
     ii. Demodulation techniques
     iii. DSB modulation in noise (SNR, detection gain)
   - SSB modulation
     i. Hilbert transform
     ii. Implementation of modulation (Phase-shift modulator)
     iii. Spectrum, Power, Bandwidth
     iv. Demodulation techniques
     v. SSB modulation in noise
   - AM modulation
     i. Implementation
     ii. Spectrum, Power, Bandwidth
     iii. Modulation index, Efficiency
     iv. Demodulation techniques (Envelope detection)
     v. AM modulation in noise
       - Coherent Demodulation
       - Envelope Detection

II. Angle Modulation
   - General
     i. Phase deviation, frequency deviation, power
     ii. Definition of PM and FM
   - Narrowband Angle Modulation
     i. Representation
     ii. Tone Modulation (Spectrum, Bandwidth)
   - Wideband Angle Modulation
     i. Tone Modulation (Modulation Index)
     ii. Bessel functions
     iii. Spectrum, Bandwidth, Deviation Ratio (Carson’s Rule)
     iv. Narrowband to Wideband Conversion (Armstrong receiver)
   - Demodulation
     i. Discriminator
     ii. PLL
   - Angle Modulation in Noise
     i. SNR analysis for PM
     ii. SNR analysis for FM
     iii. SNR analysis for FM with deemphasis filter