Lab #5
Amplifier and Noise Analysis
ECEn 464

Introduction: Amplifiers are found in nearly all microwave systems. In particular, low noise amplifiers are necessary for front-end receiver amplifiers. This lab introduces the student to means of analyzing such devices over a range of frequencies. **Be sure to provide screen shots of the pertinent information and describe what you are doing in a systematic fashion.**

Laboratory objective: Explore some important features of Low Noise Amplifiers.

Laboratory exercises:

1. Use ADS to reproduce the plots associated with Examples 11.3 and 11.4 in your book. Notice that the device parameters change as a function of frequency. Be creative in how you handle these changes.
2. Repeat Example 11.5 in your book (page 559) but with the following modifications: F_{min} = 2 dB, Γ_{opt} = .7+j.6 and S_{12} = 0. Plot the gain and noise figure circles on a Smith Chart. Be sure to label important features.
3. Perform ADS simulations to find the gain as a function of frequency for your design in part 2. Plot the total unilateral transducer gain over a wide range of frequencies and then zoom in to show important features.

Conclusion: Make some general observations about what you learned from ADS simulations of amplifiers.