ECEn 464 (Block 2)
Wireless Communication Circuits

Homework #3
Due November 13, 2013 in class

1. Derive the S-parameters for the Wilkinson divider on your own.
2. Consider the branch line coupler in Section 7.5 of the text. We want to find the output from all four ports with an excitation at port 1. Draw the even and odd mode equivalent circuits for this analysis.
3. For the branch line coupler in Pozar, Problem 7.18, use even/odd mode analysis to find the relationship between Z_a and Z_b that leads to a match at port 1 (don't worry about the power split). Hint: to have a match at port 1, the input impedance for both the even and odd modes must have zero imaginary part and real part equal to Z_0.
4. Design a high-pass lumped element filter with a 3 dB equal ripple response, a cutoff frequency of 1 GHz, and an attenuation of 40 dB at 500 MHz. Plot the response of the filter using MATLAB.
5. Derive Equation (3.7) in the lecture notes.