

**ECEn 464 (Block 2)**  
**Wireless Communication Circuits**

Homework #4

Due Wednesday, Nov. 20, 2013 in class

1. 12.2 [Gain]
2. 12.11 [Unilateral gain design]
3. 12.12 [Unilateral gain design]
4. 12.13 [Unilateral figure of merit]
5. (a) For a transistor with  $S_{11} = 0.981\angle-18.6^\circ$ ,  $S_{21} = 4.806\angle163.9^\circ$ ,  $S_{12} = 0.025\angle81.1^\circ$ ,  $S_{22} = 0.591\angle-9.2^\circ$ , approximate the transistor as unilateral and design stub matching networks for a transducer gain of 20 dB with  $g_L = 0.5$ . The source and load impedances are  $50\ \Omega$ . Choose the reflection coefficients to maximize stability. (b) What is the actual transducer gain of the amplifier?