ENEE 408D
Spring 2003
Homework 6
Due April 1, 2003 (No Joke)

Read Chp. 5, sections 6.1, 6.2, 6.3, chp. 10. in the text (BLB).
Do the following problems:

1. Calculate the $I_D - V_{DS}$ characteristics for an N-MOSFET in the linear and saturation regions. In other words, calculate I_D *vs.* V_{DS} for V_{GS} ranging from 1 to 5V in intervals of 1V. Let L=$2\mu m$ and W=$3\mu m$. Assume the CN20 process and take the CN20 device parameters from the text. (Hint: Write a simple MATLAB program to do this.)

2. Calculate the $I_D - V_{GS}$ characteristics for an N-MOSFET in the subthreshold, linear and saturation regions. In other words, calculate I_D *vs.* V_{GS} for $V_{GS} = 0.5V$. Let L=$2\mu m$ and W=$3\mu m$. Assume the CN20 process and take the CN20 device parameters from the text. (Hint: Write a simple MATLAB program to do this.)

3. 6.5 (BLB)

4. 6.7 (BLB)

5. 10.1 (Use the initial condition command in spice, and download the spice libraries using the class website. CMOSN and CMOSP are the regular spice models for the CN20 process, while CMOSNB and CMOSPB are the BSIM spice models.)

6. 10.7

7. 10.8