

EE3311 Study guide:

The following covers all the topics we have talked in the class for Ch2 and Ch5. Study the notes/text. Go over all HW problems, exercises /examples of the book. Do not forget all extra examples/problems we did in the class.

Once you are done, you should:

- 1- Know the definitions of parameters. Examples :Reflection Resistance Rule, f_T , β and etc.
- 2- Be able to draw the DC equivalent of a circuit. This is used to find the DC current and Voltages: Replace all coupling and bypass caps with open circuit
- 3- Be able to draw Small Signal equivalent circuit to calculate gain, input resistance and etc. Short all coupling and bypass caps, short all DC supplies to GND and open circuit all current supplies. This is where r_π , g_m , v_π , r_o are coming into the picture
- 4- Be able to draw the High frequency Circuit equivalent: Similar to #3, with r_x , C_μ and C_π added
- 5- Be able to recognize the type of amp you are dealing with and therefore use the appropriate equations. (CE, CB and CC)
- 6- Be able to calculate the current and voltage change due to temperature change
- 7- Be able to identify and calculate the high frequency poles (due to C_μ and C_π)
- 8- Miller Effect is always helpful, especially if you deal with high frequency poles.
- 9- Be able to identify and calculate the low frequency poles (due to C_c , C_s ,...)
- 10- Be able to recognize whether or not the device is in Active mode
- 11- Know what makes a BJT to go out of active mode (conditions and boundary voltages)
- 12- Be able to apply Reflection resistance rule
- 13- Be able to identify inverting or non inverting configurations in amplifiers of CH2
- 14- Be able to calculate different parameters like R_{in} , R_{out} , A_v , A_i of op-amps
- 15- Be able to utilize the concept of virtual short circuit
- 16- Unless otherwise mentioned, Do not ignore I_B in your calculations.

Bring your calculator and one page with equations you would like to have (one side).

Good Luck.