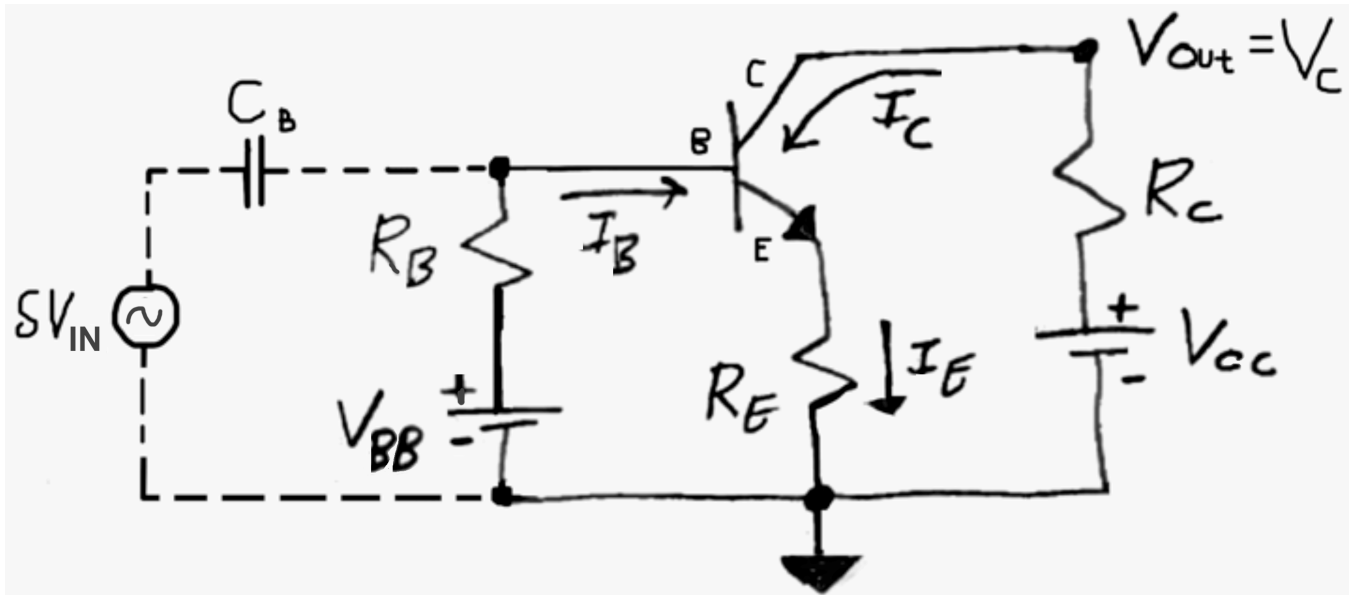


## HW on a common emitter transistor amplifier (Week 8).

We design a voltage amplifier using a BJT following the plan laid down in the handout "Notes on common emitter transistor amplifier".



Design an amplifier with a Gain  $|V_{out}/V_{in}| = 30$ .

Assume the transistor gain is  $\beta = 100$ .

Let  $V_{CC} = 15\text{ V}$ .

Choose  $V_{CE,Q} = V_{CC} - V_{CE,Sat}$ .

Choose  $I_{C,Q} = 10\text{ mA}$ .

1. Determine values of resistors  $R_C$ ,  $R_E$ , and  $R_B$  so that the gain is essentially independent of the value of  $\beta$ .
2. State and satisfy the load-line relation between  $I_{C,Q}$  and  $V_{CE,Q}$ .
3. Sketch the load line and set point on top of a constitutive
4. Convert from dual to single power supply.
5. The AC signal is high pass filtered. Determine  $C_B$  so that the cut-on frequency is  $f_{3dB} = 100\text{ Hz}$ .