Active Loads

Sameer Sonkusale
Review: Resistive Loaded C-E Amplifier

- $R_B$ and $I$ are used to bias the transistor for DC operating point
- $C_E$ and $C_{c1}$ short at AC to enable application of input $v_{\text{sig}}$ to the amplifier set in a CE configuration for amplification.
- Gain = $-g_m \cdot R_c = -I_{CQ} \cdot R_c / V_T$
Integrated Circuit: 741 Example
Remember

It is difficult to realize high values of resistors and capacitors.

It is difficult to achieve accuracy in the values of resistors and Capacitors.

Parasitic capacitances exist in all components of integrated circuits.

Design Approach:

Minimize the number of resistors and capacitors needed for a given Function. For example, use active loads in amplifiers!

Simulate for component variations for robustness.
C-E Amplifier with Current Source as Load

Current Source Load could be implemented using a DC-biased transistor
C-E Amplifier with Active Load