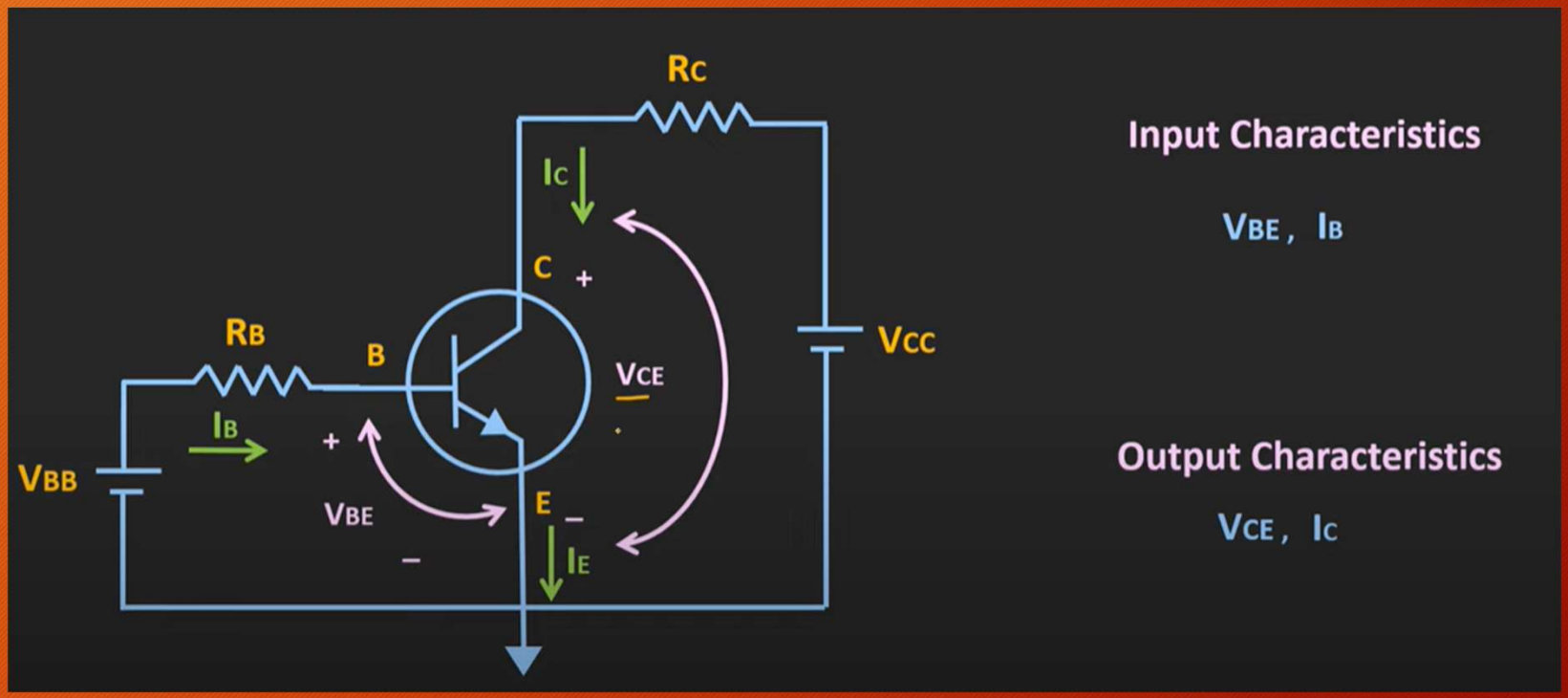
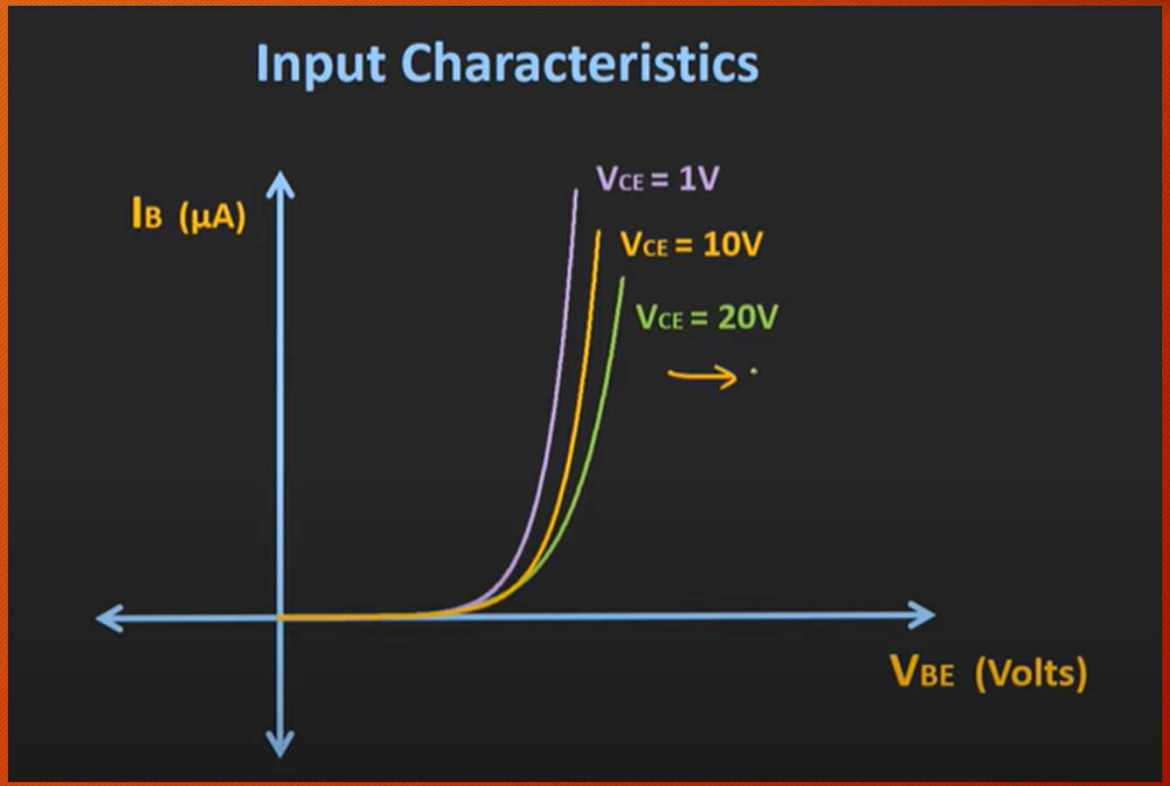
Bipolar Junction Transistor

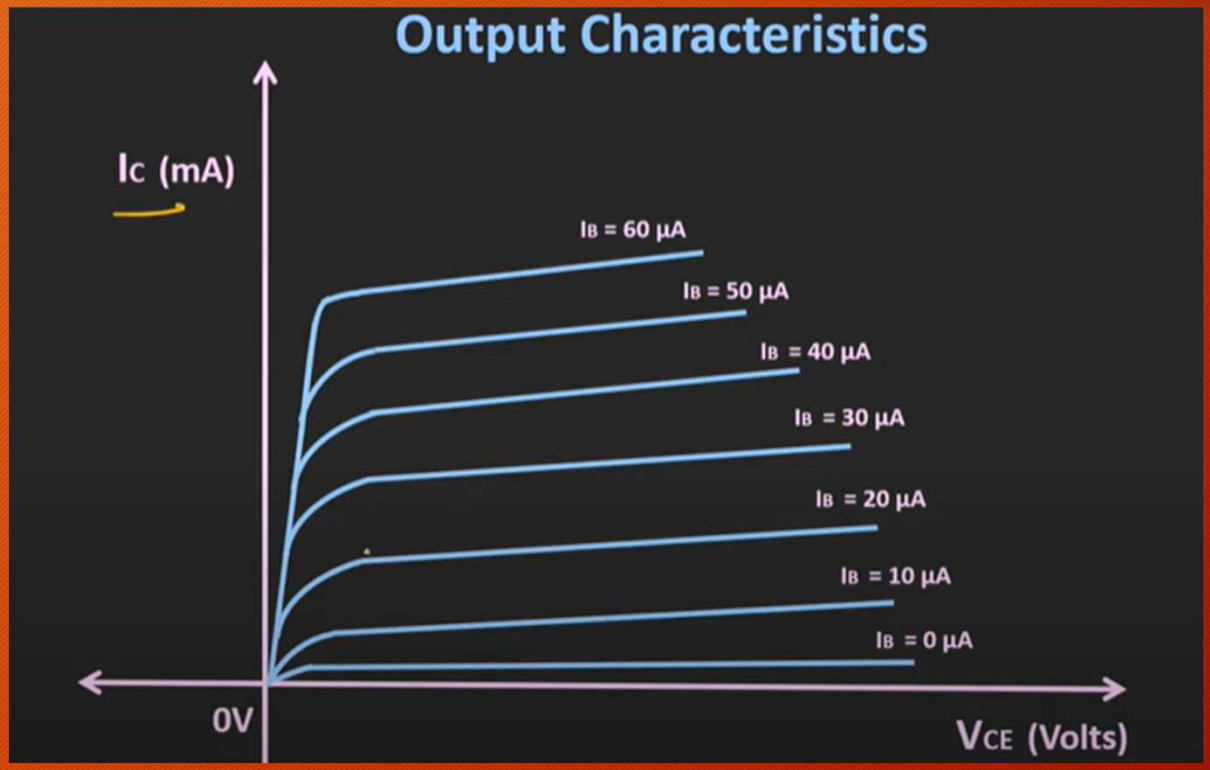
Characteristics Curve of BJT



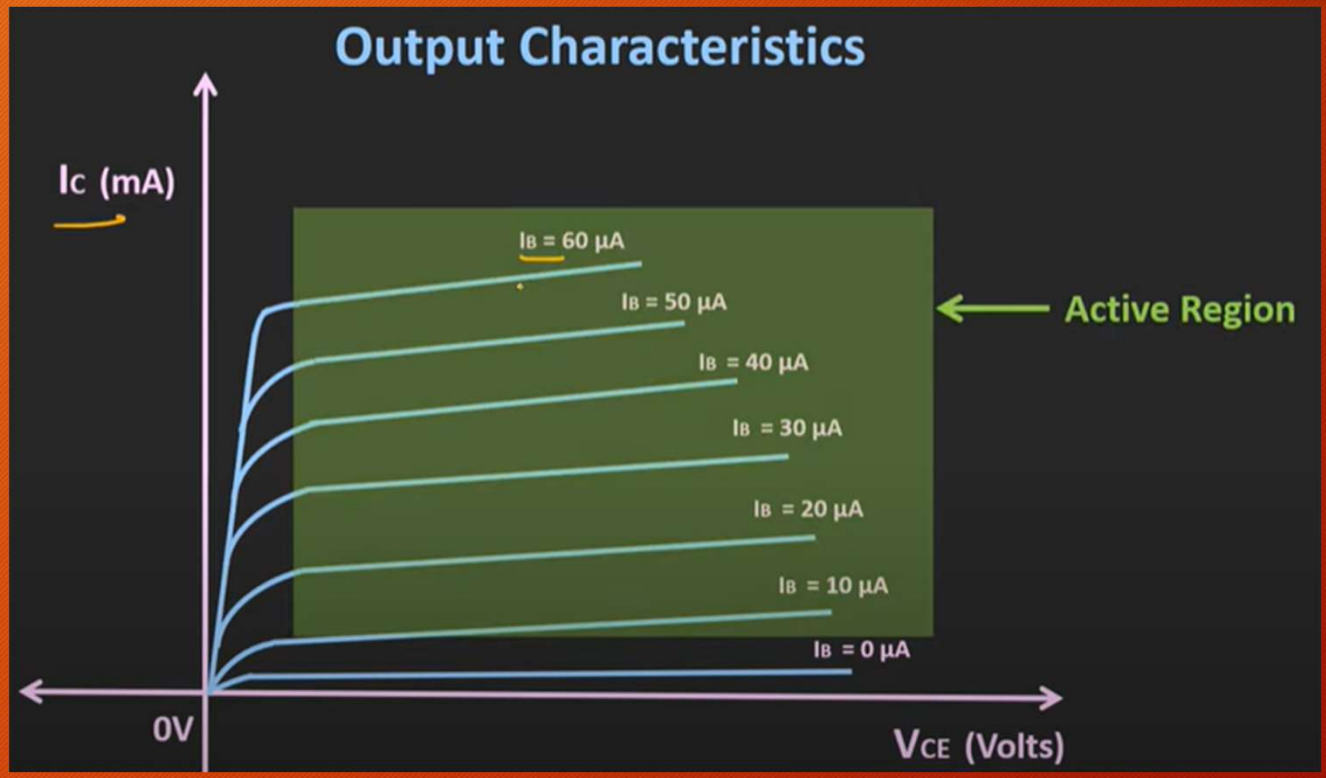
Common Emitter Input Characteristics



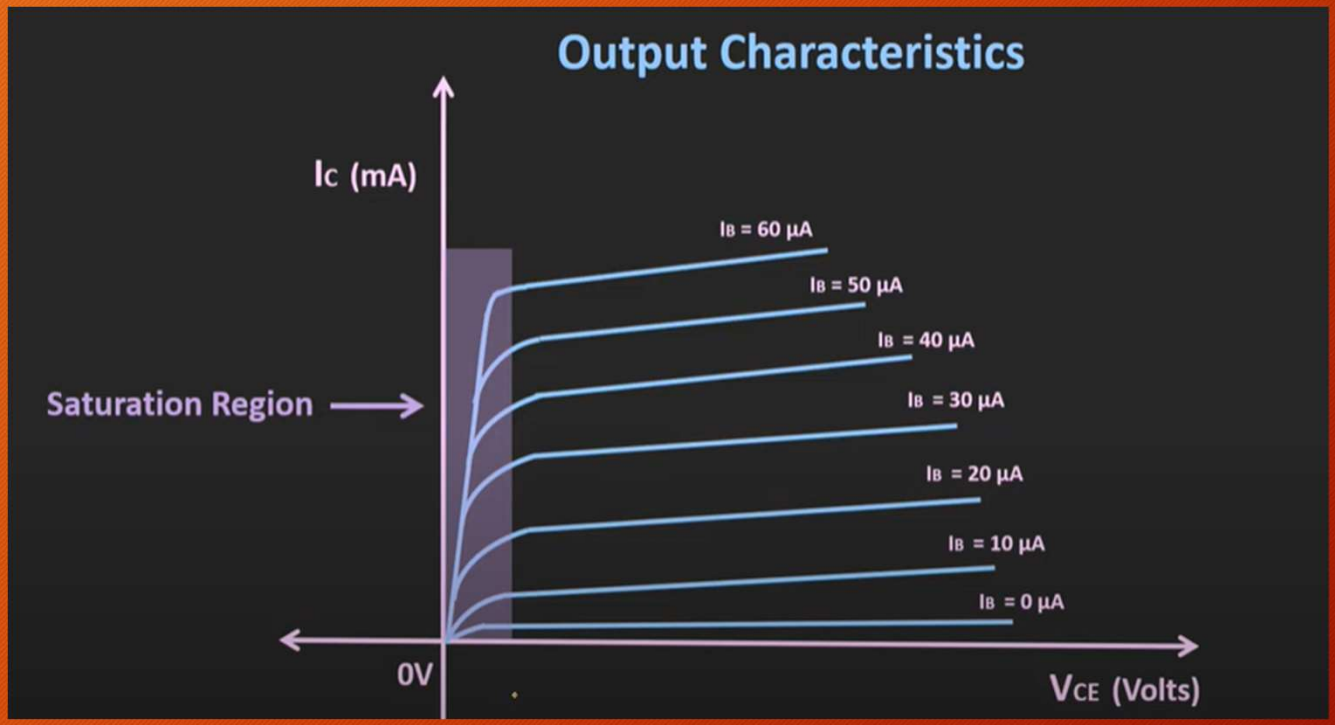
Common Emitter Output Characteristics



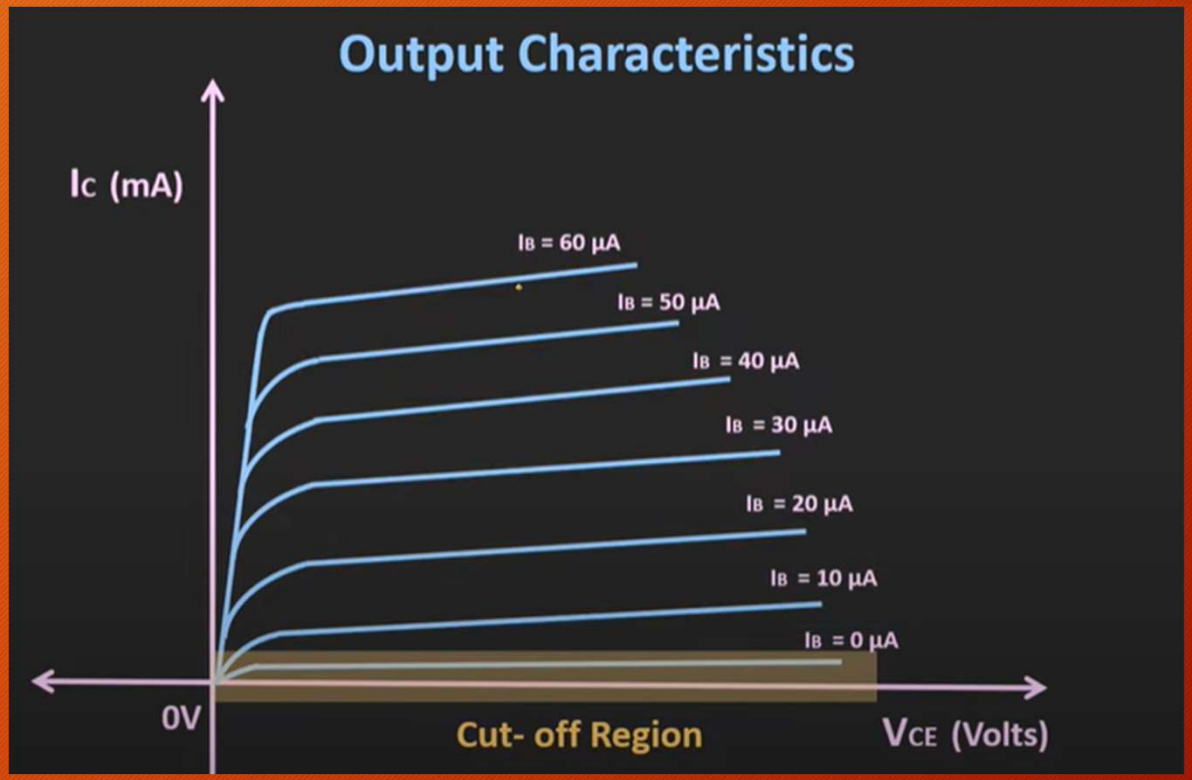
Common Emitter Output Characteristics



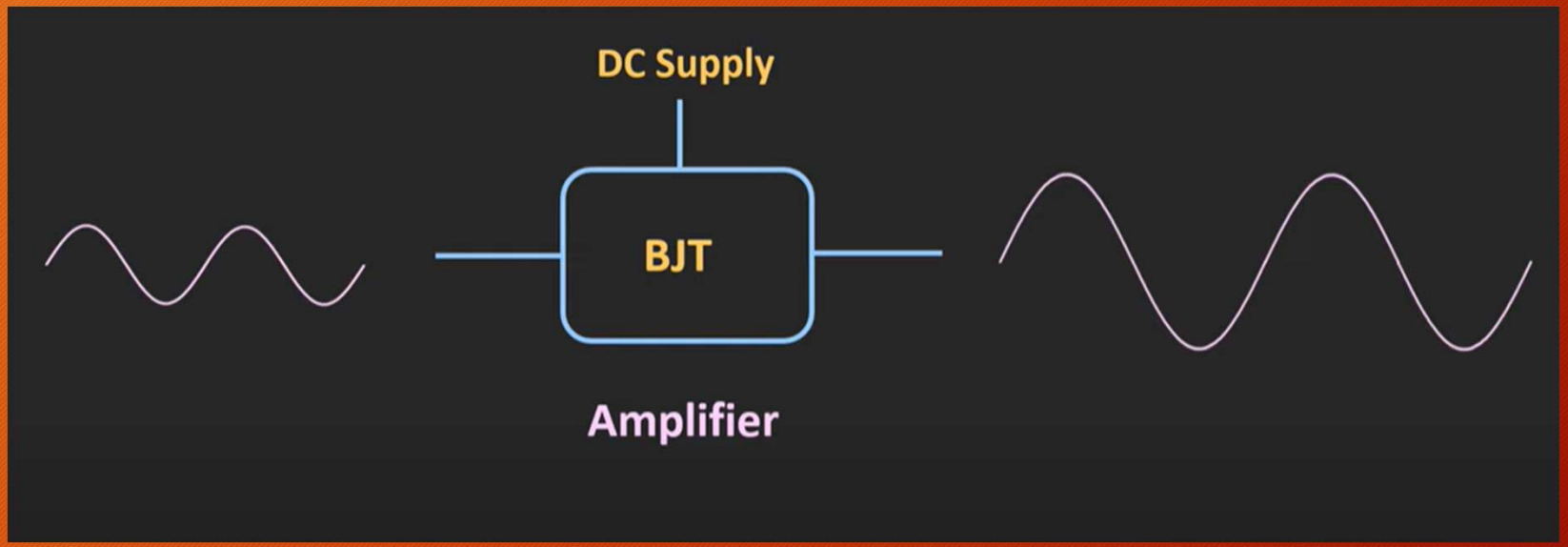
Common Emitter Output Characteristics



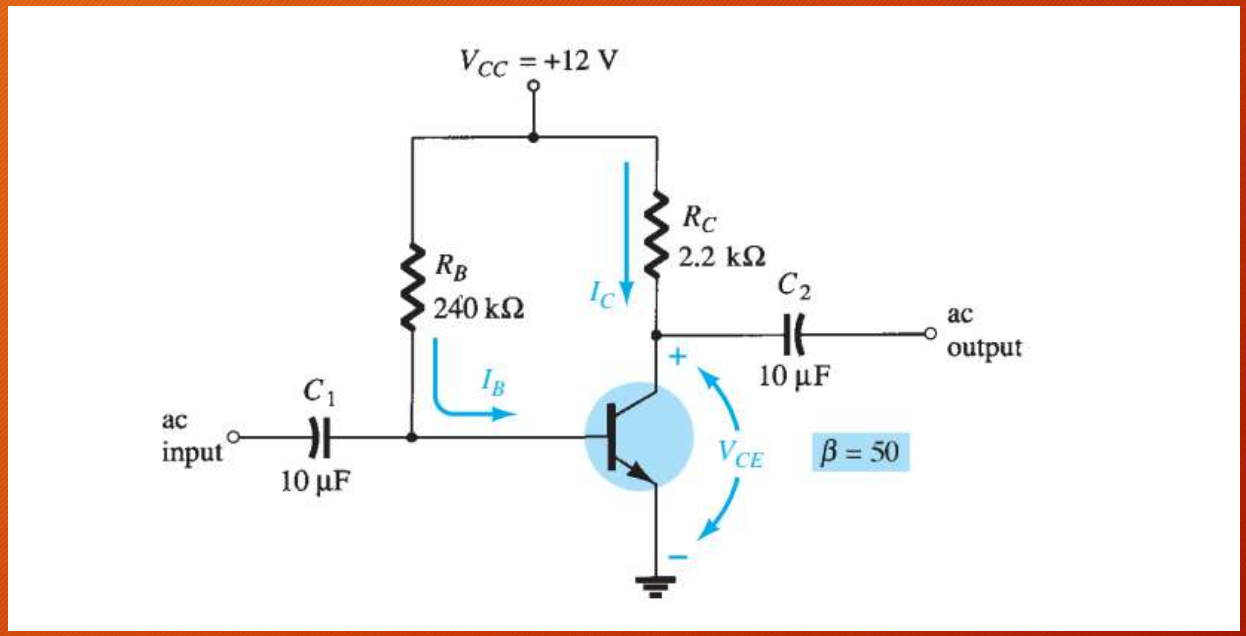
Common Emitter Output Characteristics



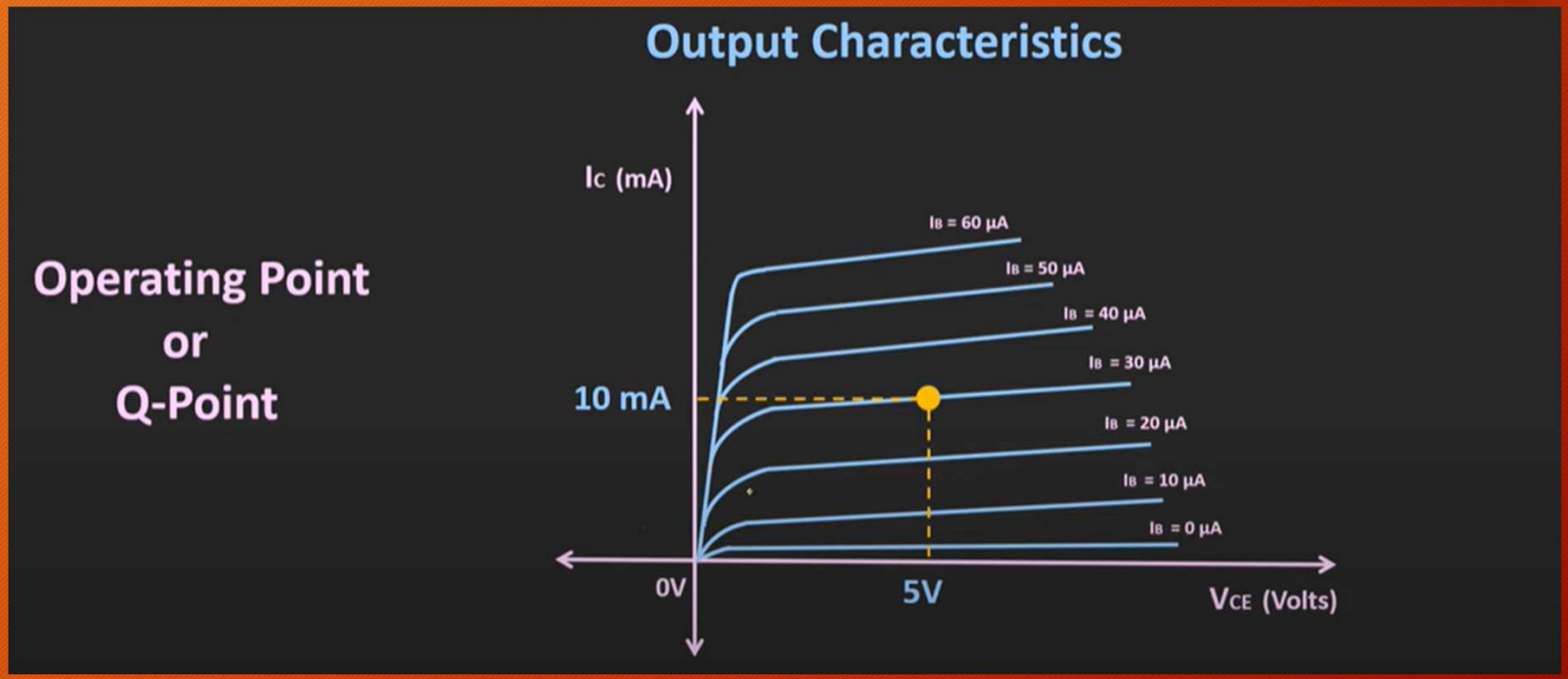
Transistor Biasing



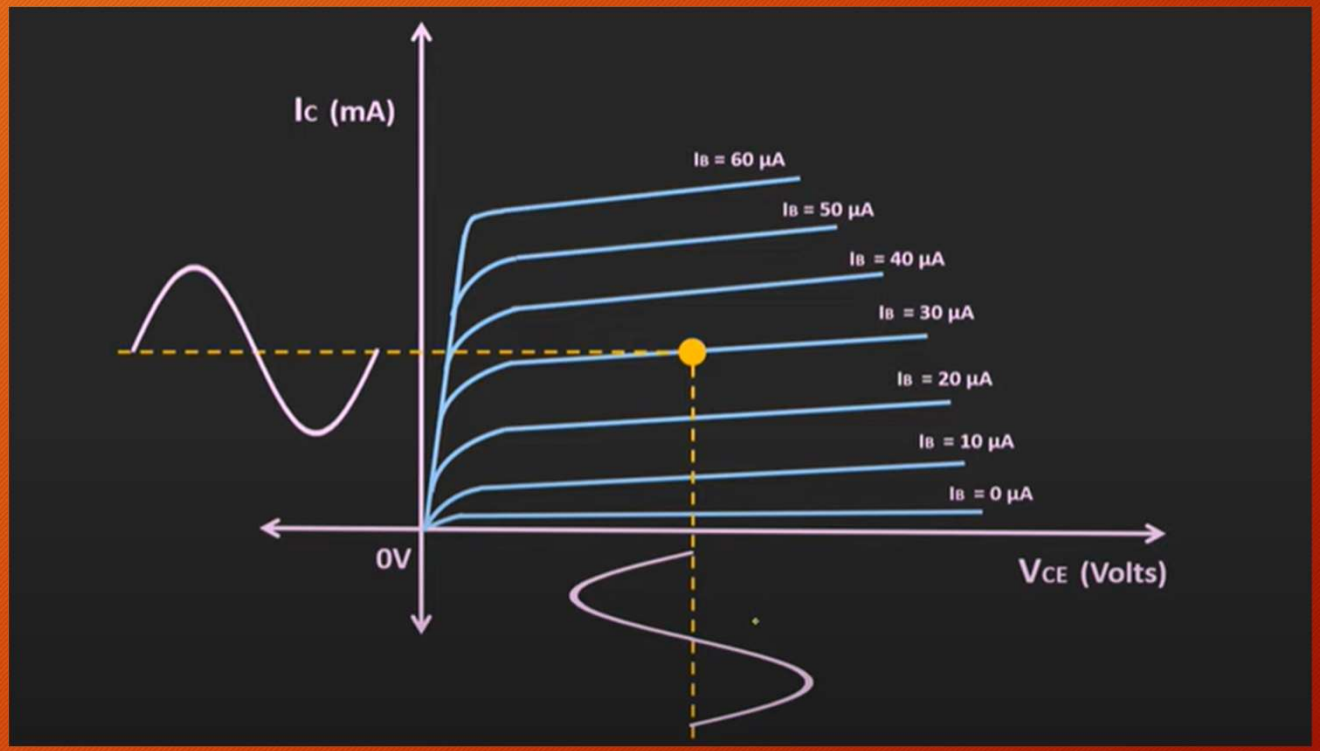
Transistor Biasing



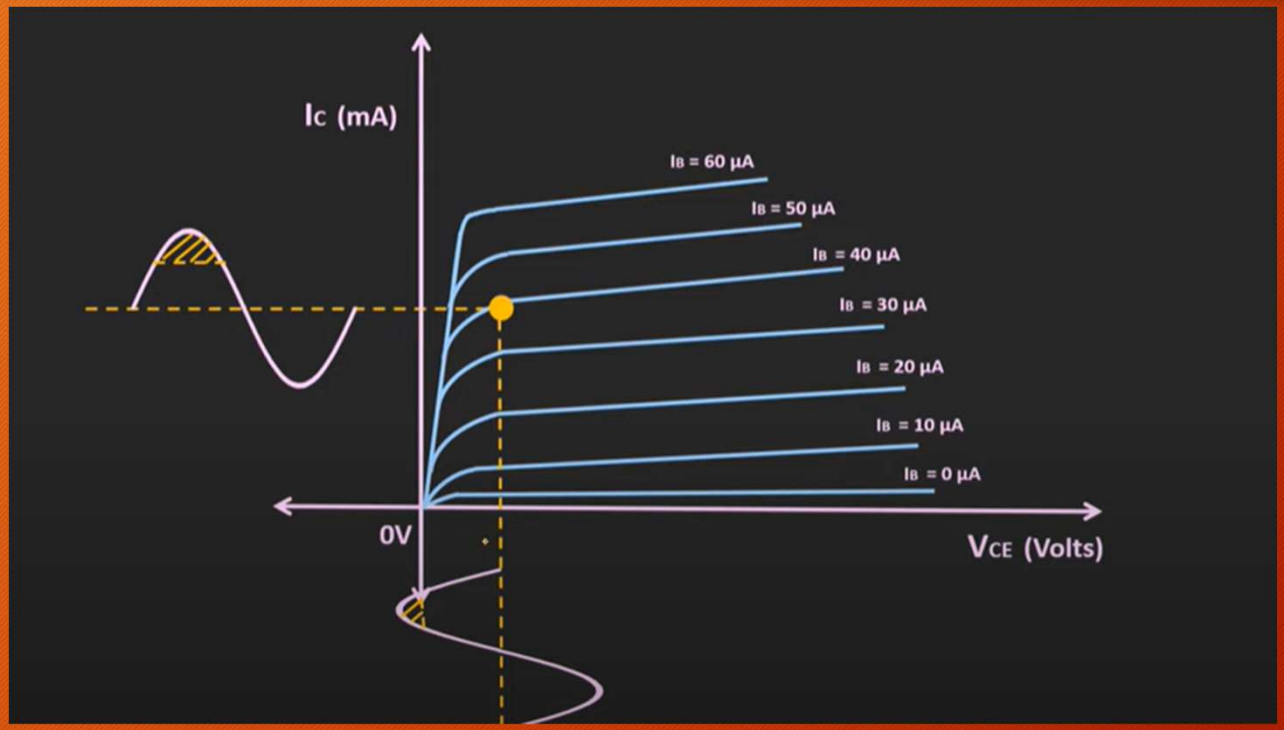
Operating Point of BJT



Operating Point of BJT

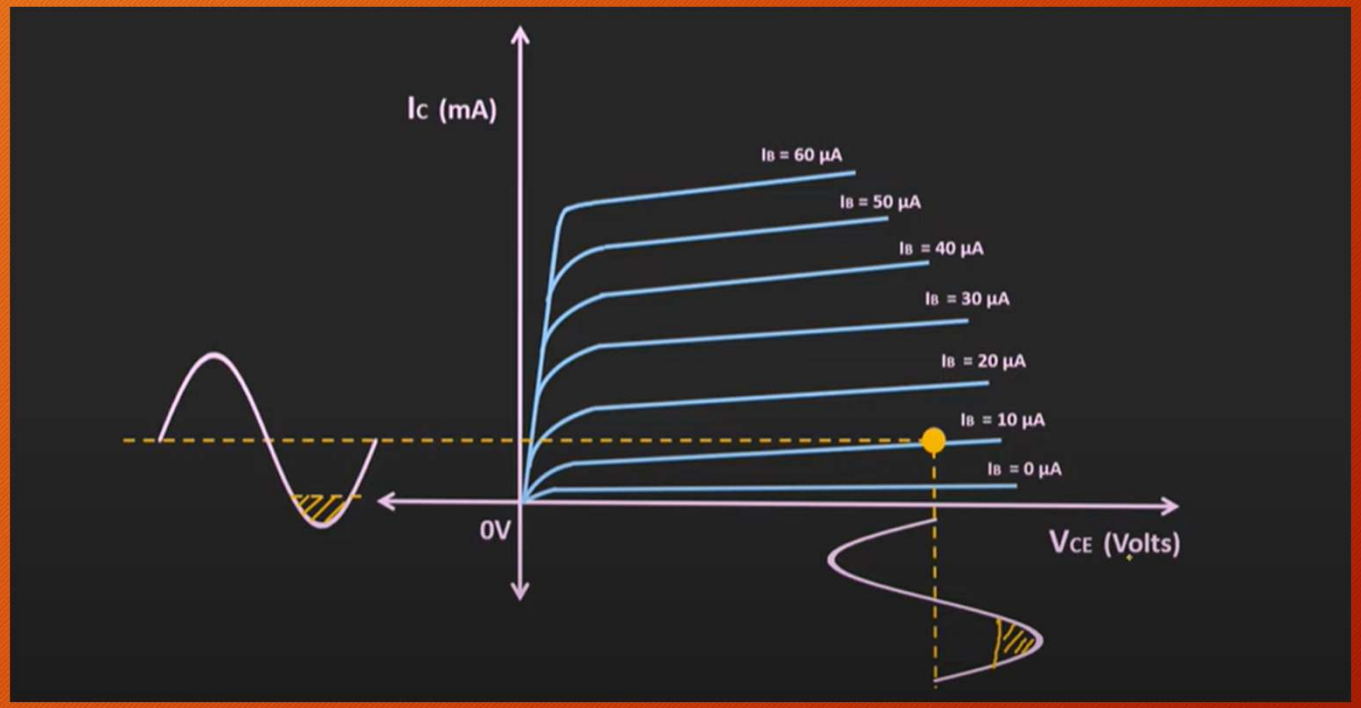


Operating Point of BJT



When the operating point is near the saturation region, and we apply AC signal some portion of the amplified signal will get clipped because the voltage Vce cannot go beyond 0 volt

Operating Point of BJT



When the operating point is near the cutoff region, and we apply AC signal some portion of the amplified signal will get clipped because the current Ic cannot go beyond 0 ampere.

Operating Point of BJT

Whenever the operating point will be near cutoff region or saturation region then it may lead to the nonlinear distortion in output waveform.

DC Load Line

Load-Line Analysis

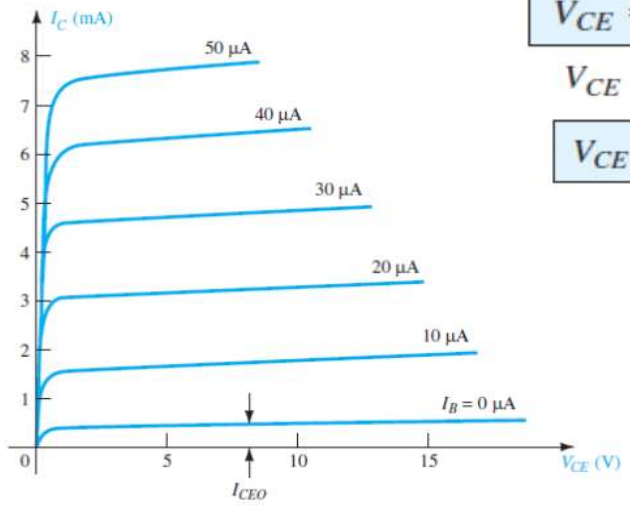
$$V_{CE} = V_{CC} - I_C R_C$$

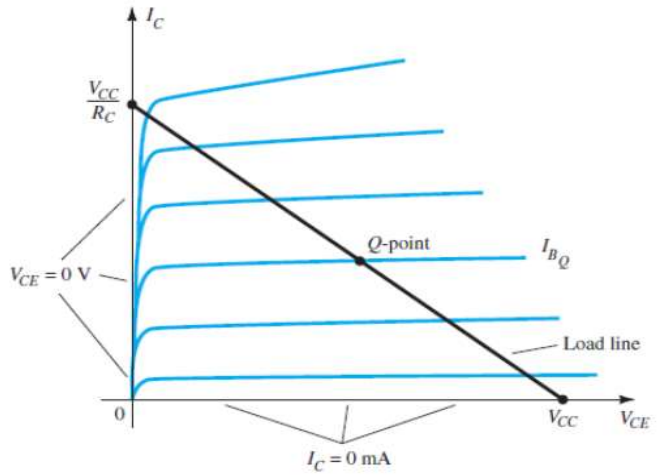
$$V_{CE} = V_{CC} - (0)R_C$$

$$V_{CE} = V_{CC}|_{I_C = 0\ \text{mA}}$$

$$0 = V_{CC} - I_C R_C$$

$$I_C = \frac{V_{CC}}{R_C}\bigg|_{V_{CE} = 0\ \text{V}}$$





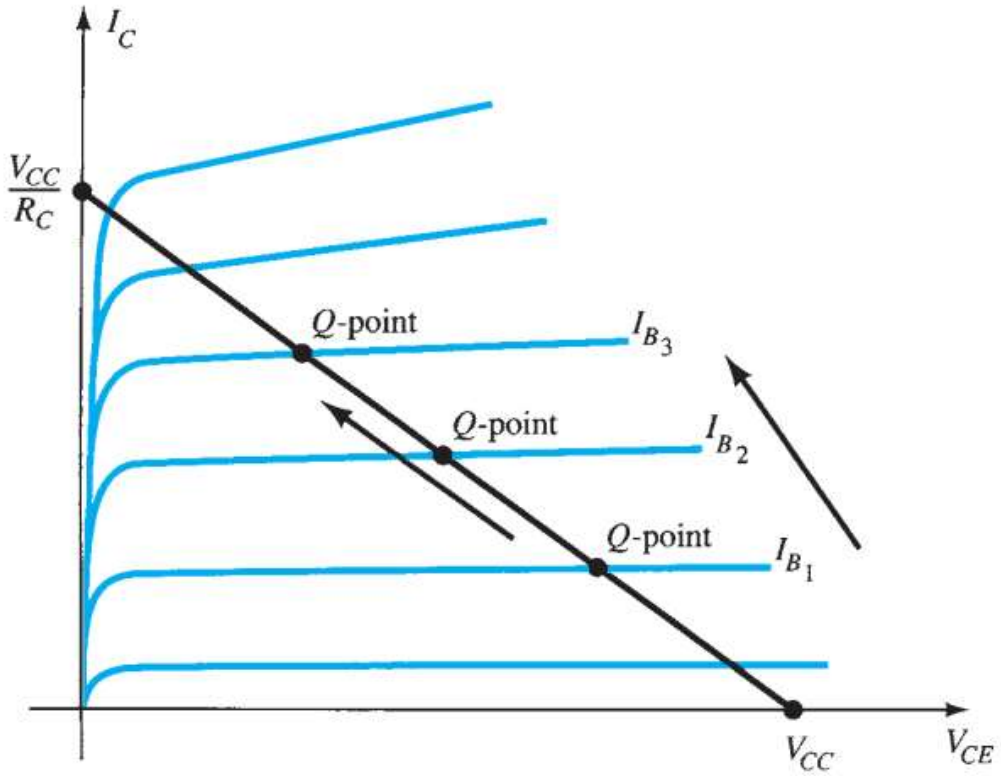


FIG. 4.13

Movement of the Q-point with increasing level of I_B.

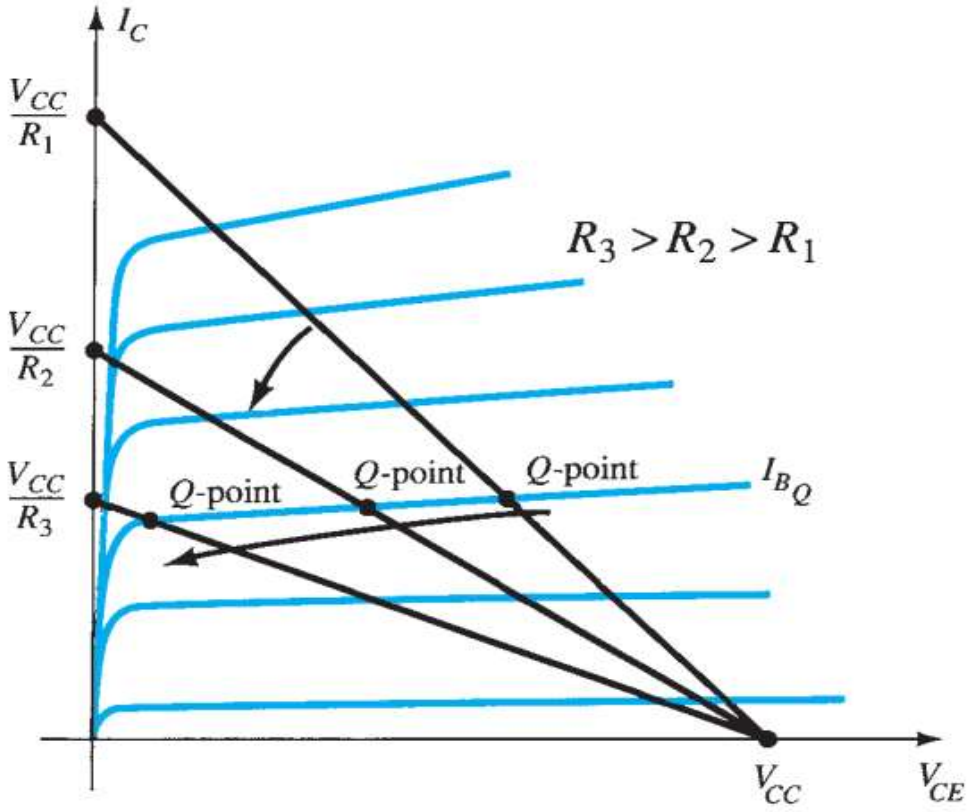


FIG. 4.14

Effect of an increasing level of R_C on the load line and the Q-point.

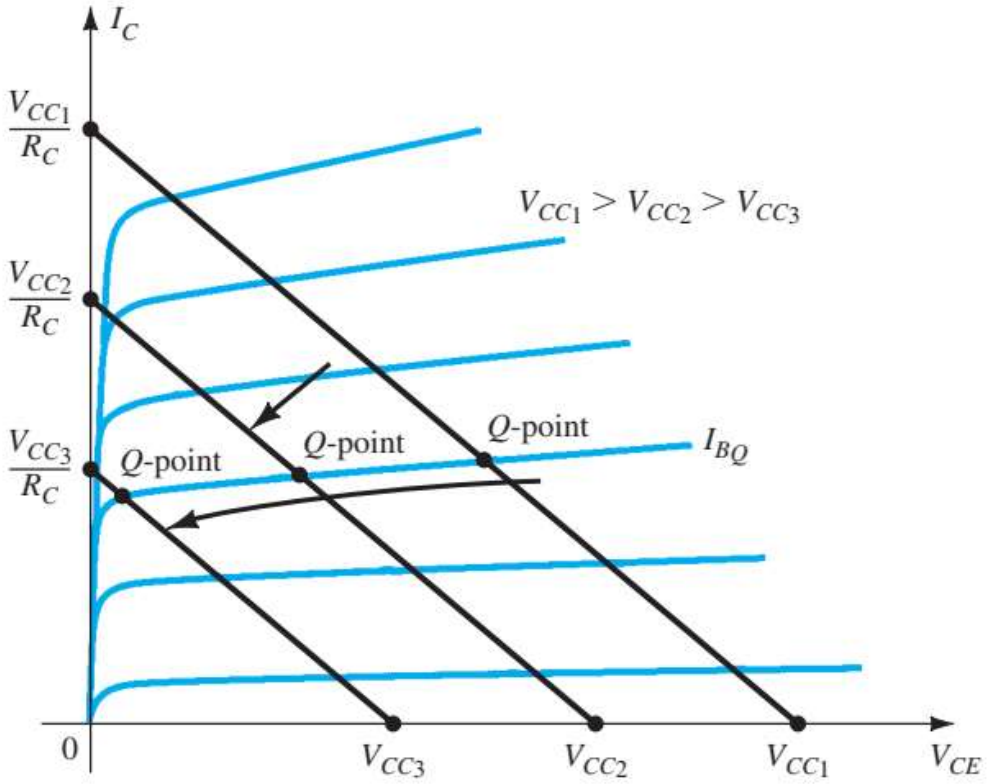


FIG. 4.15

Effect of lower values of V_{CC} on the load line and the Q-point.