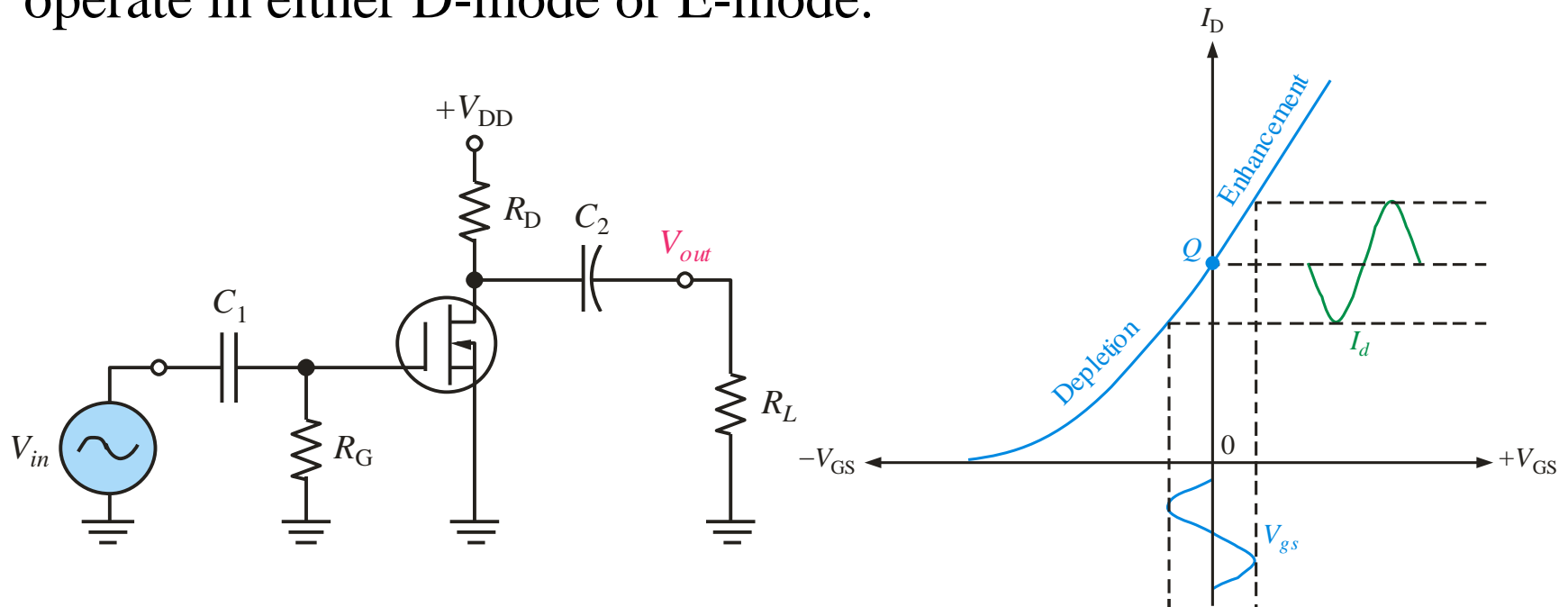


Lecture 18:Field Effect Transistors (FETs) (4)

Common Drain Amplifiers, Common Gate Amplifiers, Cascode Amplifier, Class D amplifier

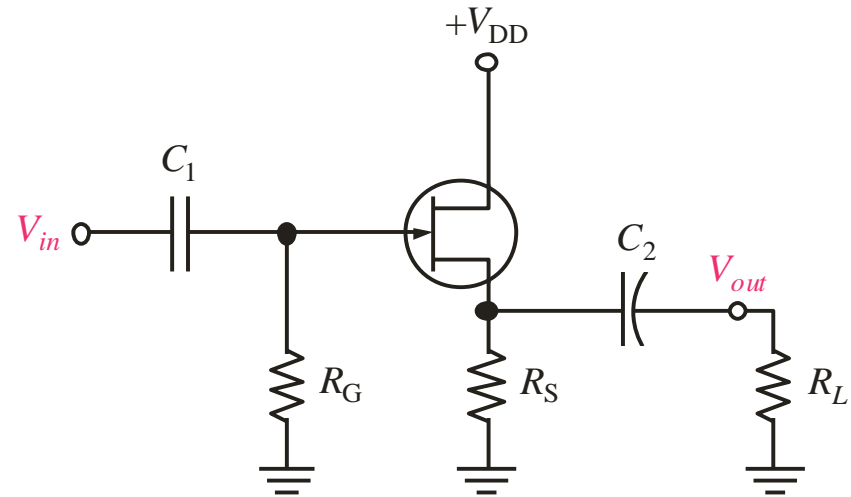
D-MOSFET

In operation, the D-MOSFET has the unique property in that it can be operated with zero bias, allowing the signal to swing above and below ground. This means that it can operate in either D-mode or E-mode.



Common Drain Amplifier

In a CD amplifier, the input signal is applied to the gate and the output signal is taken from the source. There is no drain resistor, because it is *common* to the input and output signals.



The voltage gain is given by the equation $A_v = \frac{g_m R'_s}{1 + g_m R'_s}$.

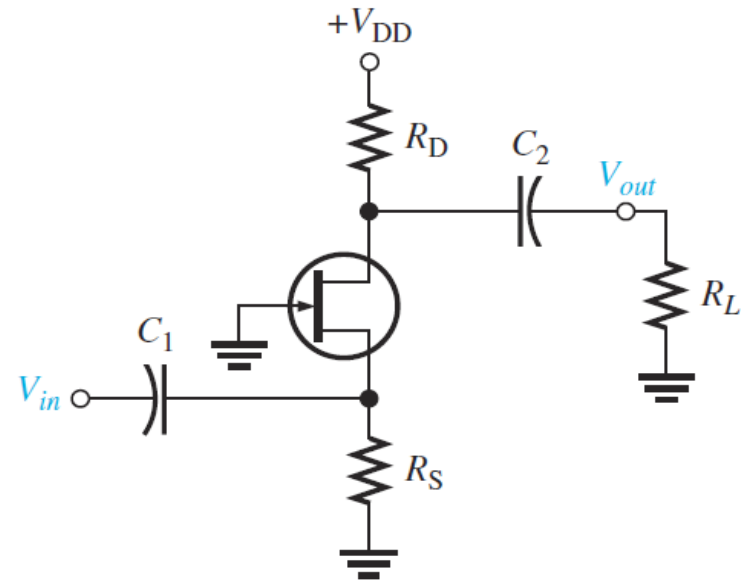
The voltage gain is always < 1 , but the power gain is not.

Common Gate Amplifier

The input is applied to the Source and the output is collected from the Drain. The Gate is grounded and is common to both the input and the output

voltage gain $A_v = g_m (R_D // R_L)$

low input resistance $R_{in} = 1/g_m$



Cascode Amplifier

the Cascode connection is a combination of CS and CG amplifiers. This forms a good high-frequency amplifier.

