

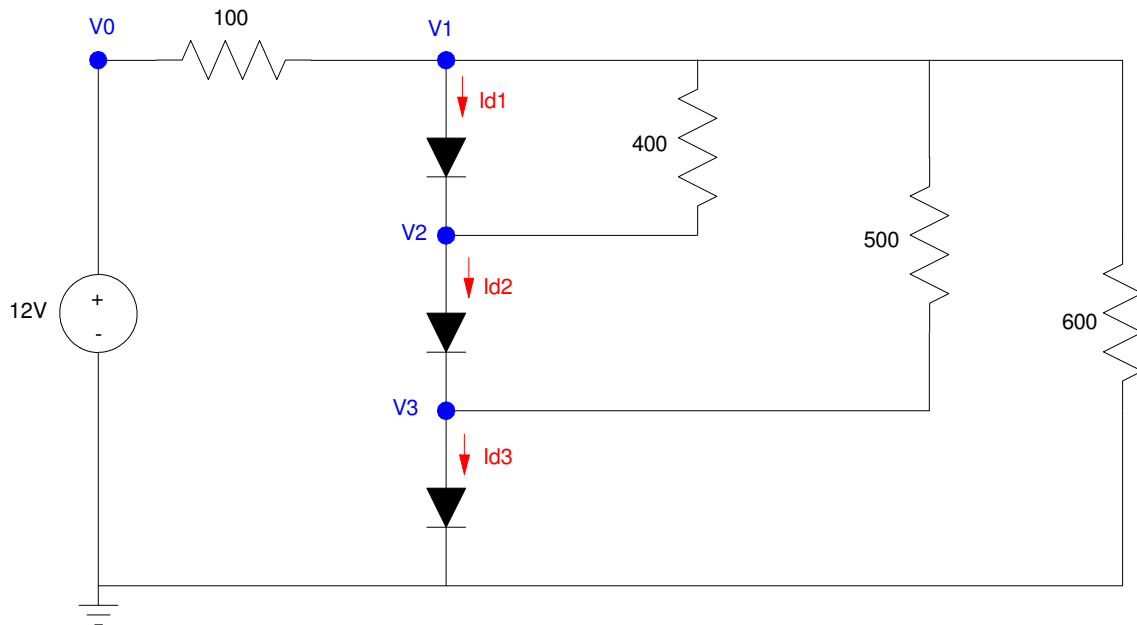
# ECE 320: Handout #5

## Diodes

Assume the VI relationships of the diodes are

$$I_d = 10^{-8} \left( \exp \left( \frac{V_d}{0.052} \right) - 1 \right)$$

Write the voltage node equations for the following circuit



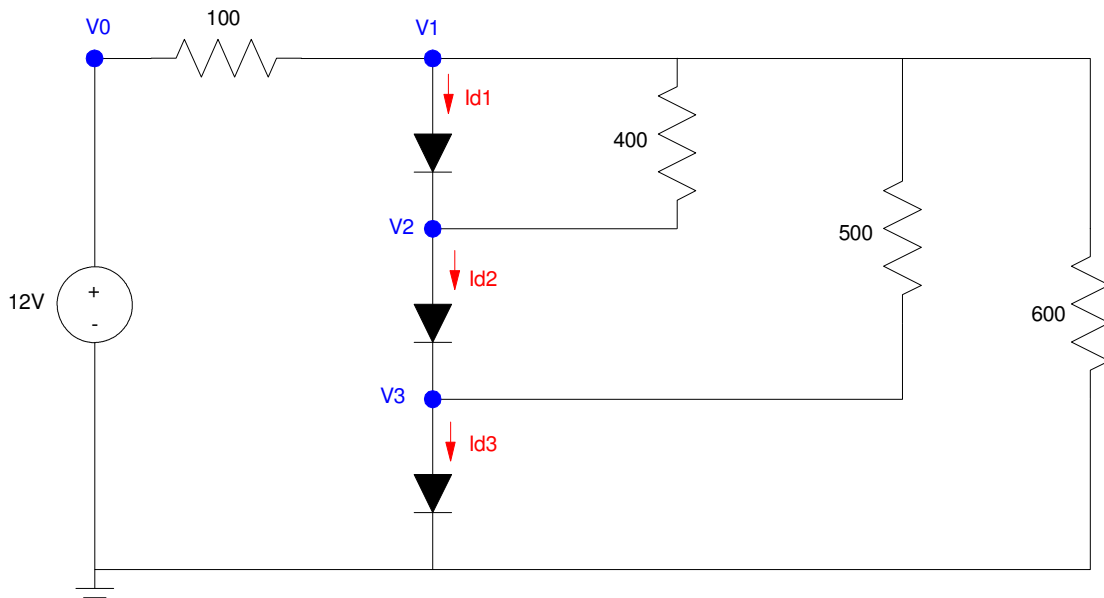
# ECE 320: Handout

## Lecture #5: Diodes

Assume the VI relationships of the diodes are

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Write the voltage node equations for the following circuit



Diode equations

$$I_{d1} = 10^{-8} \left( \exp \left( \frac{V_1 - V_2}{0.052} \right) - 1 \right)$$

$$I_{d2} = 10^{-8} \left( \exp \left( \frac{V_2 - V_3}{0.052} \right) - 1 \right)$$

$$I_{d3} = 10^{-8} \left( \exp \left( \frac{V_3}{0.052} \right) - 1 \right)$$

Voltage Node Equations

$$\left( \frac{V_1 - 12}{100} \right) + I_{d1} + \left( \frac{V_1 - V_2}{400} \right) + \left( \frac{V_1 - V_3}{500} \right) + \left( \frac{V_1}{600} \right) = 0$$

$$-I_{d1} + I_{d2} + \left( \frac{V_2 - V_1}{400} \right) = 0$$

$$-I_{d2} + I_{d3} + \left( \frac{V_3 - V_1}{500} \right) = 0$$