



TEKNIK ELEKTRONIKA

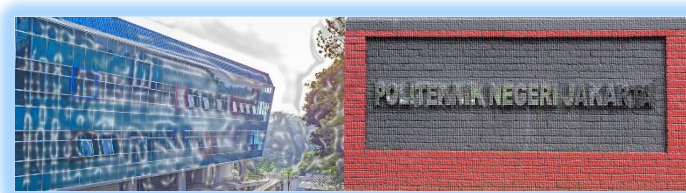
Dasar Rangkaian Listrik

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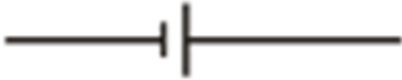

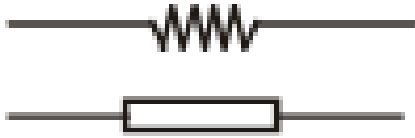




Learning Outcome

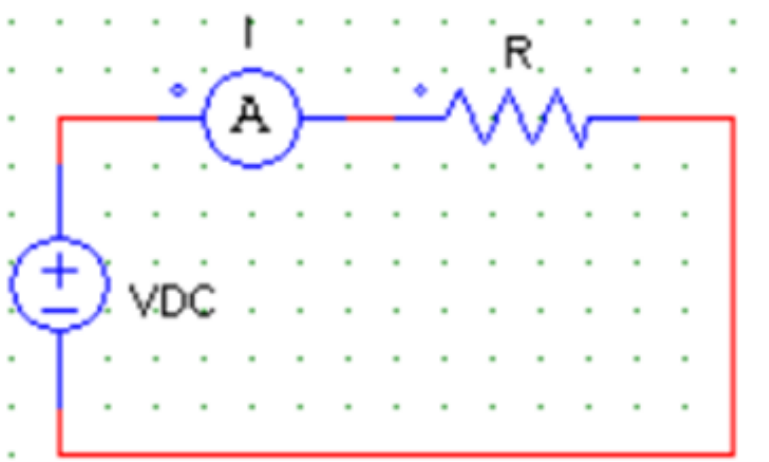
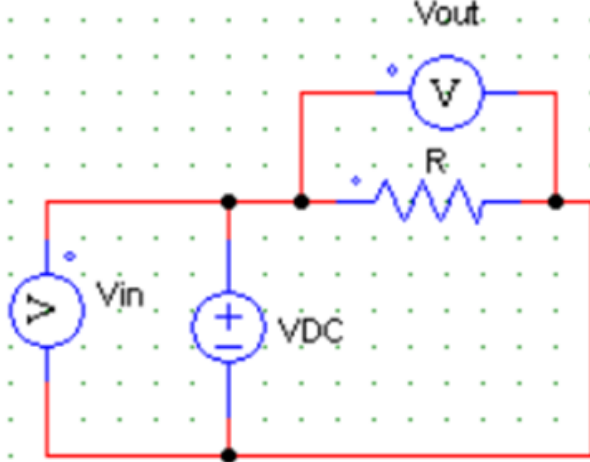
At the end of the session the students will be able to:

- Explain the understanding of Basic Electrical Circuit

Simbol Komponen Rangkaian Listrik

	Sumber tegangan atau beda potensial
	Penghantar berarus listrik; arah panah menunjukkan arah aliran arus listrik
	Hambatan listrik atau resistor
	Amperemeter atau alat ukur arus listrik
	Voltmeter atau alat ukur tegangan

Pengukuran Arus dan Tegangan

Pengukuran Arus Listrik	Pengukuran Tegangan
<p>Pengukuran arus listrik dilakukan secara seri terhadap beban yang akan diukur.</p>	<p>Pengukuran tegangan dilakukan secara paralel terhadap beban yang akan diukur</p>
 <p>A circuit diagram on a grid background showing a series connection. On the left is a DC voltage source labeled 'VDC' with a '+' sign at the top and a '-' sign at the bottom. To its right is an ammeter labeled 'A' with a vertical line through it. Further right is a resistor labeled 'R'. The circuit is completed by a red wire at the bottom.</p>	 <p>A circuit diagram on a grid background. On the left is a DC voltage source labeled 'VDC' with a '+' sign at the top and a '-' sign at the bottom. A voltmeter labeled 'V' with 'Vin' next to it is connected in parallel across the VDC source. To the right of the VDC source is a resistor labeled 'R'. A second voltmeter labeled 'V' with 'Vout' next to it is connected in parallel across the resistor 'R'. The circuit is completed by a red wire at the bottom.</p>

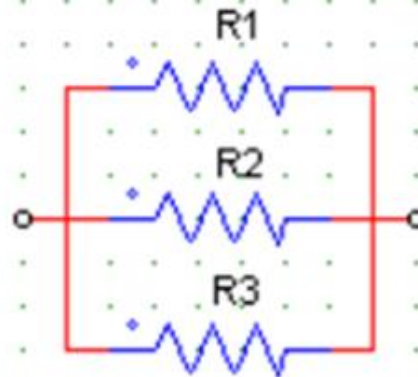
Bentuk Rangkaian Resistor

Resistor Seri



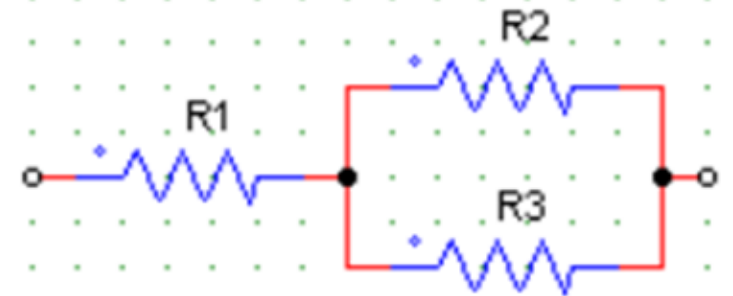
$$R_s = R_1 + R_2 + R_3$$

Resistor Paralel

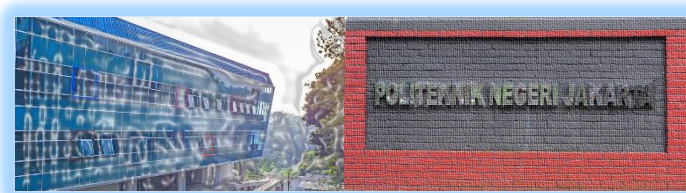


$$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

Resistor Seri-Paralel



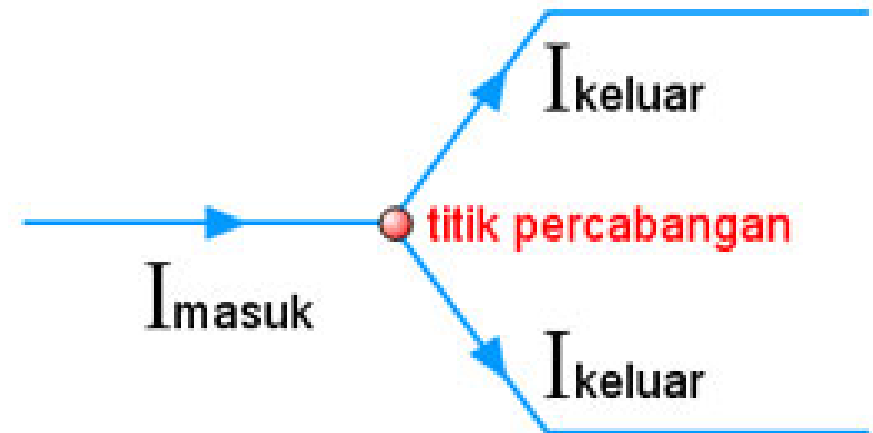
$$R_c = R_s + R_p$$

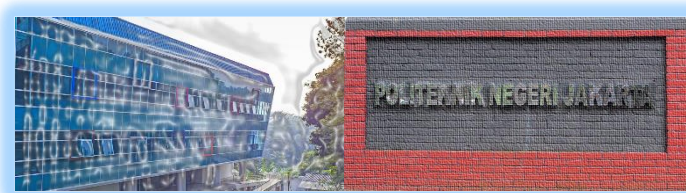


Hukum Kirchoff I

“Jumlah kuat arus listrik yang masuk ke suatu titik cabang sama dengan jumlah kuat arus listrik yang keluar dari titik cabang tersebut “

$$\Sigma I_{masuk} = \Sigma I_{keluar}$$

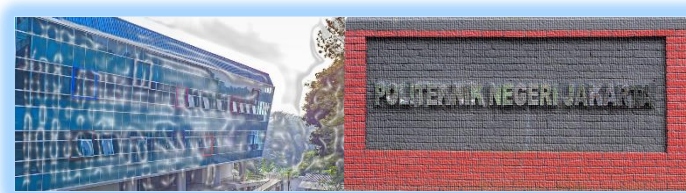




Hukum Kirchoof II

“Di dalam sebuah rangkaian tertutup, jumlah aljabar gaya gerak listrik (E) dengan penurunan tegangan ($I.R$) sama dengan nol“

$$\Sigma E + \Sigma IR = 0$$

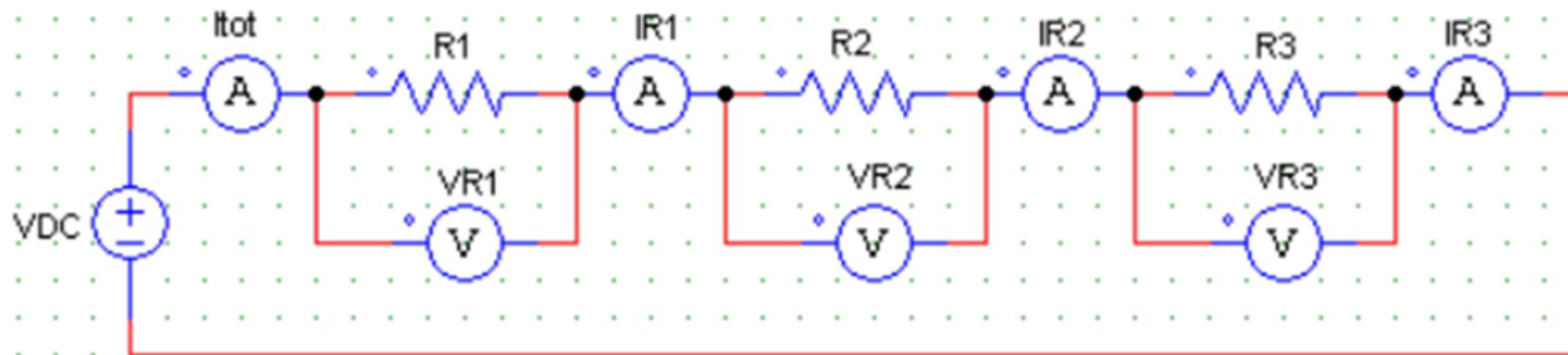


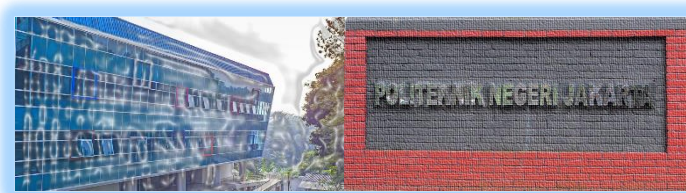
Rangkaian Pembagi Tegangan

$$I_{tot} = I_{R1} = I_{R2} = I_{R3}$$

$$V_{DC} = V_{R1} + V_{R2} + V_{R3}$$

$$V_{R1} = \frac{R_1 \cdot V_{DC}}{R_S}; \quad V_{R2} = \frac{R_2 \cdot V_{DC}}{R_S}; \quad V_{R3} = \frac{R_3 \cdot V_{DC}}{R_S}$$





Rangkaian Pembagi Arus

$$V_{DC} = V_{tot} = V_{R1} = V_{R2} = V_{R3}$$

$$I_{tot} = I_{R1} + I_{R2} + I_{R3}$$

$$I_{R1} = \frac{R_p \cdot I_{tot}}{R_1} = \frac{V_{tot}}{R_1}; \quad I_{R2} = \frac{R_p \cdot I_{tot}}{R_2} = \frac{V_{tot}}{R_2}; \quad I_{R3} = \frac{R_p \cdot I_{tot}}{R_3} = \frac{V_{tot}}{R_3}$$

