Electricity and magnetism

1

$$E = \frac{V}{d}$$

$$V = \frac{\Delta U}{q}$$

2

$$W = qV$$

Connects 1, 2

$$W = qEd$$

$$B = \frac{\mu_0 I}{2\pi r}$$

$$B = \frac{\mu_0 N I}{L}$$

$$\Phi = B_{\parallel} A = BA\cos\theta$$

Faradays Law in Module 6

$$\varepsilon = -N\frac{\Delta\Phi}{\Delta t}$$

$$\frac{V_p}{V_s} = \frac{N_p}{N_s}$$

force on charge in electrical field

$$\vec{F} = q\vec{E}$$

Force between parallel current carrying conductors

$$F = \frac{1}{4\pi\varepsilon_0}\frac{q_1 q_2}{r^2}$$

$$I = \frac{q}{t}$$

$$V = IR$$

Module 4

$$P = VI$$

$$F = qv_{\perp}B = qvB\sin\theta$$

force on moving charge in magnetic field

$$F = lI_{\perp}B = lIB\sin\theta$$

force on current carrying wire.

$$\frac{F}{l} = \frac{\mu_0}{2\pi}\frac{I_1 I_2}{r}$$

$$\tau = nIA_{\perp}B = nIAB\sin\theta$$

$$V_p I_p = V_s I_s$$

transformers

Quantum, special relativity and nuclear

De Broglies wavelength

$$\lambda = \frac{h}{mv}$$

Photoelectric Effect

$$K_{max} = hf - \phi$$

$$\lambda_{max} = \frac{b}{T}$$

$$E = mc^2$$

energy mass equivalence

$$E = hf$$

Rydberg Equation

$$\frac{1}{\lambda} = R\left(\frac{1}{n_f^2} - \frac{1}{n_i^2}\right)$$

$$t = \frac{t_0}{\sqrt{\left(1 - \frac{v^2}{c^2}\right)}}$$

$$l = l_0\sqrt{\left(1 - \frac{v^2}{c^2}\right)}$$

$$p_v = \frac{m_0 v}{\sqrt{\left(1 - \frac{v^2}{c^2}\right)}}$$

Special relativity

$$N_t = N_0 e^{-\lambda t}$$

$$\lambda = \frac{\ln 2}{t_{\frac{1}{2}}}$$

radioactive decay in module 7