**Equations Ch. 20-22**

**Magnetic force on moving charge**

\[ F_B = qvB \sin \phi \]

**Circular motion in magnetic field**

\[ F = qvB = \frac{mv^2}{r} \]

**Force on current**

\[ F = ILB \sin \theta \]

**Magnetic torque**

\[ \tau = IBA \sin \theta \]

**Faraday’s law**

\[ \Phi = BA \cos \vartheta \]

**Lenz’s Law:** An induced current always flows in a direction that opposes the change that caused it.

\[ \epsilon = Blv \]  

**Alternating current**

\[ V = V_{\text{max}} \sin \omega t \]

\[ V_{\text{rms}} = I_{\text{rms}} R \]

\[ \omega = 2\pi f = \frac{2\pi}{T} \]

\[ V_{\text{rms}} = V_{\text{max}} / \sqrt{2} \]

\[ I_{\text{rms}} = I_{\text{max}} / \sqrt{2} \]