Magnetic induction formulae

Faraday-Lenz's law of induction: *emf* (ε) induced in N loops by flux variation (ϕ)	$\varepsilon = -N\dfrac{\Delta\phi}{\Delta t}$, $\varepsilon = -N\dfrac{d\phi}{dt}$
Self-inducted *emf* (ε) in a loop by current variation (I)	$\varepsilon = -L\dfrac{\Delta I}{\Delta t}$, $\varepsilon = -L\dfrac{dI}{dt}$
Self-inducted *emf* (ε) in a mobile conductor of length (l) and speed (v) inside a magnetic field (B)	$\varepsilon = B \cdot l \cdot v \cdot \sin\theta$
Self-inductance of a coil of (N) loops with section (S) and length (l)	$L = \dfrac{\mu N^2 S}{l}$, $L = \dfrac{NBS}{I}$, $L = \dfrac{N\phi}{I}$ $\mu = \mu_r \mu_0$
Energy of coil with electrical current (I) and self-inductance (L)	$T = \dfrac{1}{2} L \cdot I^2$
Transformer (P=Primary winding, S=Secondary winding)	$\dfrac{V_S}{V_P} = \dfrac{N_S}{N_P} = \dfrac{I_P}{I_S}$
Flux through a loop	$\phi = B \cdot S \cdot \cos\alpha$

Symbol	Magnitude	S.I. unit
ε	Emf (electromotive force) (Volt)	V
B	Magnetic field (Tesla)	$T = N \cdot A^{-1} \cdot m^{-1}$
I	Current intensity (Ampere)	$A = C \cdot s^{-1}$
ϕ	Magnetic flux (Weber)	$Wb = T \cdot m^2$
N	Number of loops in a coil	
L	Self-inductance of a coil (Henry)	H
t	Time	s
v	Speed	$m \cdot s^{-1}$
V	Voltage in a transformer (Volt)	V
l	Length of conductor or solenoid	m
S	Loop section	m^2
α	Angle between magnetic field vector and normal vector of loop	rad *or* degrees
θ	Angle between magnetic field vector and velocity vector	rad *or* degrees
T	Coil energy	J
μ_0	Permeability of vacuum (constant) = $4 \cdot \pi \cdot 10^{-7}$	$T \cdot m \cdot A^{-1}$
μ	Permeability of material	$T \cdot m \cdot A^{-1}$
μ_r	Relative permeability of material	