Equations for ECE3354

$pf = \frac{P}{S} = \cos\theta$ Z= R+jX $|Z| = \frac{|V|}{|I|} = \sqrt{R^2 + X^2}$

ω = 2πf

S=VI P=S*Cos(θ) Q=S*Sin(θ)

$S = \sqrt{P^2 + Q^2}$ $P = \sqrt{S^2 - Q^2}$ $Q = \sqrt{S^2 - P^2}$

$P_D = (I_2)^2 R_2 \left(\frac{1-s}{s}\right)$ $E_A = K\omega_m I_F$ $E_A = V_T - I_A R_A$

$R = \frac{V^2}{P} = \frac{P}{I^2}$ $X = \frac{V^2}{Q} = \frac{Q}{I^2}$ Vcore = Vnl – Inl * Z1 (complex)

$n_s = \frac{120\ f}{P}$ $\omega_m = n_m \frac{2\pi}{60}$ slip = ( $n_s$ – $n_m$) / $n_s$

P = $\tau\omega_m$

$Xs = \sqrt{Z^2 - R_A^{\ 2}}$ $Z = \frac{V_{RATED}}{I_{RATED}} @ I_F$ $R_{AC} = (1.2)(R_{DC})$

Zs = Rs + j Xs Zp = Rp || j Xp

Rp = U / Rs j Xp = U / Xs U = Rs^2 + Xs^2

Rs = Rp / (W^2 +1) j Xs = ( Xp * W^2) / (W^2 +1) W= Rp / Xp