ECE 3600 Final Exam Study Guide

Review: Monday, 12/9, 4:00 pm in regular classroom

Final Exam: Tuesday, 12/10, 1:00 pm in regular classroom

Arn will be in WEB L105 Friday 12/6 1:00 - 4:00 for a ECE 2210 review and Monday 8:00am - 10:00 for their Final

First part of Exam is Closed book, Closed notes, No calculator, ~ 30 - 90 points.

The second part will be Closed book, except for the note sheets handed out in class for exam 1 and exam 2 and the final. You may add to these sheets. The second part will be problems. Total: 160 points, both parts.

I've been extremely frustrated that some students don't seem to be learning the basic concepts, relying instead on "formulas" and examples. You may want to keep this in mind while studying.

The exam will cover

1. Material from Exam 1 and Exam 2

2. HW 1 AC steady-state review, used extensively throughout class

3. HW 2 RMS & Single-phase AC power. Possibly part of 3φ problem

   \[
   P, \quad Q, \quad S, \quad |S|, \quad \text{pf correction of pf}
   \]

   Basic relationships and units

3. HW 2 RMS & Single-phase AC power. Possibly part of 3φ problem

   Basic magnitude and phase relationships

4. HW 3 Energy sources, plant efficiencies

   Lots possible

5. HW 4 & 5 3-phase AC power.

   \[
   V_L, \quad V_{LL}, \quad V_{LN}, \quad I_L, \quad I_{LL}, \quad I_Y, \quad S_{3φ}, \quad S_{1φ}
   \]

   Basic magnitude and phase relationships

6. HW 6 Magnetic circuits

   \[
   B = \mu H, \quad H = \frac{N \cdot i}{l_m}
   \]

   Flux density, Field intensity, Permeability, B-H curve. effects of nonlinearity on some currents (3rd harmonic).

7. HW 7 - 9 Transformers

   Calculations
   Impedance transformation
   OC & SC Tests --> model
   η & VR
   Autotransformers
   3φ Transformers Δ & 3rd harmonic

   Basic relationships
   losses, ideal/non construction, ratings, magnetization reactance, core losses, winding losses, leakage reactance.

   Autotransformers questions
8. HW SG1 & SG2 Synchronous generators and motors
   Know the phasor diagram!

   Basic relationships
   losses, construction, limits, operation

9. HW Ind1 - Ind3 Induction motors
   Know the model!
   Powers $P_{AG}$ $P_{conv}$ $P_{out}$ etc. $\eta$
   Torque & speeds
   Types & effect of $R_2$
   Single phase motors

   Basic relationships
   Poles, slip, why, how
   Question 7-11 HW17, p3

   Typ torque-speed curves

10. HW DC1 - DC2 DC motors
    Know the model!
    Powers $P_{conv}$ $P_{out}$ etc. $\eta$
    Torque & speeds
    Series-wound & universal motors

    Basic relationships
    Torque-speed curve

11. HW TL1 Transmission Lines
    Short, Med, Long $Z_C$ SIL
    Series impedance $Z_{series}$
    Shunt admittance & $\frac{Y_{shunt}}{2}$
    Shunt impedance & $2Z_{shunt}$

    Basic relationships
    Common line voltages
    Short, Med, Long mi, km
    Surge impedance
    Surge impedance loading
    What is & why use bundling

   Models and calculations

12. All Labs
13. All Field trips

Bolded items are more likely