ECE 3600 Final Exam Study Guide

Review: Tuesday, 12/15, 3:30 - 5:00 pm in regular classroom

Final Exam: Wednesday, 12/16, 1:00 pm in regular classroom OR WEB 2230

Arn will be in WEB 2230 Monday 12/14 3:00 - 5:00 for a ECE 2210 review and Tuesday 8:00am - 10:00 for their Final

in and arround office 11:00 - 3:30 Tuesday, 12/15

The first part will be a **closed book, no calculator** questions, probably ~ 50 - 70 points.

The second part will be a **open book, open notes, with calculator** problems. 4 or 5 problems, probably 90 - 110 points. The whole exam will be worth 160 points.

The exam will cover	(closed book) Possible questions
1. Material from Exam 1 and Exam 2	Study the questions from exam 1 and 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 Q S $\|S\|$ pf correction of pf	Basic relationships and units
4. HW 3 Energy sources, plant efficiencies	Lots possible
5. **HW 4 & 5 3-phase AC power.** V_L V_{LL} V_{LN} I_L I_{LL} I_Y $S_{3\phi}$ $S_{1\phi}$ $Z_Y = \frac{Z_\Delta}{3}$ $Z_\Delta = 3 \cdot Z_y$ pf correction of pf	Basic magnitude and phase relationships
6. HW 6 Magnetic circuits $B = \mu \cdot H$ $H = \frac{N \cdot i}{l_m}$	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	losses, ideal/non construction, ratings, magnetization reactance, core losses, winding losses, leakage reactance.
Autotransformers	Autotransformers
3ϕ Transformers Δ & 3rd harmonic	**questions**

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8. HW 9 - 10 One-Line Diagrams, variations pu system — Why? basics
   - Per-phase and pu analysis — common symbols
   - Calculations
   - Base transformation
   - Base Values S_{base} V_{base} I_{base} Z_{base}

9. **HW SG1 & SG2 Synchronous generators and motors** — losses, construction, limits, operation
   - Know the phasor diagram!

10. **HW** Ind1 **- Ind3 Induction motors** — Poles, slip, why, how
    - Know the model! — Question 7-11 HW17, p3
    - Powers P_{AG} P_{conv} P_{out} etc. η
    - Torque & speeds
    - Types & effect of R_2 — Typ torque-speed curves
    - **Single phase motors** — Single phase starting

11. **HW DC1 - DC2 DC motors**
    - **Know the model!** — Torque-speed curve
    - **Powers** P_{conv} P_{out} etc. η
    - **Torque & speeds**
    - **Series-wound & universal motors** — Torque-speed curve

12. **HW TL1 Transmission Lines**
    - Short, **Med**, Long Z_C SIL — Common line voltages
    - Short, Med, Long mi, km
    - Series impedance $\mathbf{Z_{series}}$ Shunt admittance & $\frac{\mathbf{Y_{shunt}}}{2}$ — Surge impedance
    - Surge impedance loading
    - Shunt impedance & $2 \cdot \mathbf{Z_{shunt}}$ — What is & why use bundling
    - **Models and calculations**

13. All Labs — **questions**

14. Both Field trips — **questions**

Bolded items are more likely