

ECE 3600 Final Exam Study Guide

Review: Wednesday, 12/17, 3:30 - 5:00 pm in regular classroom

Final Exam: Thursday, 12/18, 1:00 pm in regular classroom

Arn will be in WEB 2250 Friday 12/12 3:00 - 5:00 for a ECE 2210 review and Monday 8:00am - 10:00 for their Final

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

1. Material from Exam 1 and Exam 2

(closed book)
Possible questions

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 3 ϕ problem**

Basic relationships and units

P Q S $|S|$ pf correction of pf

4. HW 3 Energy sources, plant efficiencies

Lots possible

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

Basic magnitude and
phase relationships

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

6. HW 6 Magnetic circuits

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

$B = \mu \cdot H$ $H = \frac{N \cdot i}{l_m}$

7. **HW 7 - 9 Transformers**

Calculations

Impedance transformation

OC & SC Tests --> model

η & VR

Autotransformers

3 ϕ Transformers Δ & 3rd harmonic

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

Autotransformers

questions

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8. HW 9 - 10 One-Line Diagrams, variations pu system

Per-phase and pu analysis

Calculations

Base transformation

Base Values S_{base} V_{base} I_{base} Z_{base}

Why? basics

common symbols

9. HW SG1 & SG2 Synchronous generators and motors

Know the phasor diagram!

losses, construction,
limits, operation

10. HW Ind1 - Ind3 Induction motors

Know the model!

Powers P_{AG} P_{conv} P_{out} etc. η

Torque & speeds

Types & effect of R_2

Single phase motors

Poles, slip, why, how

Question 7-11 HW17, p3

Typ torque-speed curves

Single phase starting

11. HW DC1 - DC2 DC motors

Know the model!

Powers P_{conv} P_{out} etc. η

Torque & speeds

Series-wound & universal motors

Torque-speed curve

Torque-speed curve

12. HW TL1 Transmission Lines

Short, **Med**, Long Z_C SIL

Series impedance Z_{series} Shunt admittance & $\frac{Y_{shunt}}{2}$
Shunt impedance & $2 \cdot Z_{shunt}$

Models and calculations

Common line voltages

Short, Med, Long mi, km

Surge impedance

Surge impedance loading

What is & why use bundling

13. All Labs

questions

Bolded items are more likely