

Review: Wednesday, 12/15, 4:00 pm in regular classroom ??

Final Exam: Thursday, 12/16, 1:00 pm in regular classroom

Arn will be in WEB L105 Wednesday 8:00am - 10:00 for ECE2210 Final

First part of Exam is **Closed book, Closed notes, No calculator**, ~ 0 - 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.

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 Q S $|S|$ pf correction of pf

4. HW 3 Energy sources, plant efficiencies

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

6. HW 6 Magnetic circuits

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

7. HW 7 - 9 Transformers

Calculations

Impedance transformation

OC & SC Tests --> model

η & VR

Autotransformers

3φ Transformers Δ & 3rd harmonic

8. One-Line Diagrams, variations and Per-Unit analysis

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

Basic per-unit modeling and calculations

Possible questions

Study the questions from exam 1 and 2

Basic relationships and units

Lots possible

Basic magnitude and phase relationships

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

Basic relationships

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

Autotransformers

Y or Δ

Common symbols, why PU

Bases, why and when do they change

Why per-unit?

9. Motor Basics

Terms, Stator, Rotor, etc.
Armature, Field, back EMF
Torque, Speed, Power
Friction, Windage
Slip rings, brushes

10. HW SG1 & SG2 Synchronous generators and motors

Know the phasor diagram!

Basic relationships

losses, construction,
limits, operation

Not covered in previous exams

11. HW Ind1 - Ind3 Induction motors

Know the model!

Powers P_{AG} P_{conv} P_{out} etc. η

Torque & speeds

Types & effect of R_2

Basic relationships

Poles, slip, why, how

Question 7-11 HW17, p3

Typ torque-speed curves

12. Single phase induction motors

Types of starting methods

Centrifugal switches

Phase modification for start winding

Calculation of Impedances and Capacitors

Single phase starting

Magnetic fields

Starting direction

Optimal Phase difference

13. HW DC1 - DC2 DC motors

Know the model!

Powers P_{conv} P_{out} etc. η

Torque & speeds

Series-wound & universal motors

Basic relationships

Torque-speed curves

14. Motor Load types & Torque-speed curves

Especially in relation to DC motors

15 HW TL1 Transmission Lines

Short, **Med**, Long Z_C

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

Models and calculations

Basic relationships

Common line voltages

Short, Med, Long mi, km

What is & why use bundling

16. All Labs

17. Gadsby Field trip

Bolded items are more likely