

The first part will be a **closed everything, no calculator** questions, ~ 15 - 25 points. Rest of Exam is **closed book**, except for the note sheets handed out in class for exam 1 and exam 2. You may add to these sheets.

The exam will cover

1. Transformers  
Non-ideal transformer model tests    OC    SC
  
2. Auto-transformers
  
3. 3-phase transformers
  
4. One-Line Diagrams, variations and Per-Unit analysis  
Base Values     $S_{\text{base}}$      $V_{\text{base}}$      $I_{\text{base}}$      $Z_{\text{base}}$   
Basic per-unit modeling and calculations
  
5. Motor Basics
  
6. Synchronous generators and motors  
Know the phasor diagram! Problems like Hw SG1 & SG2
  
7. 3-phase induction motor basics
  
8. Homeworks 8B - Ind2
  
9. Labs 1 - 2

Possible questions

- Misc. Information from transformer notes
- Wiring  
New rating
- Y or  $\Delta$
- Common symbols, why PU  
Bases, why and when do they change  
Why per-unit?
- Terms, Stator, Rotor, etc.  
Armature, Field, back EMF  
Torque, Speed, Power  
Friction, Windage  
Slip rings, brushes
- losses, construction, limits, operation  
poles - speed  
Bringing a generator on line
- Operation  
Slip and frequencies  
Poles - speed  
Questions from homework Ind1  
Typ torque-speed curves
- Transformer modeling