ECE 419/619, Electric Machines and Drives, Spring 2013
Exam #2, May 3rd, 11:30am - 2:00pm

5 Questions, 1 sheet of notes allowed

Exam Topics

Permanent-Magnet Synchronous Machines
- PMSM model
- Steady-state calculations with ideal drive
- Determining flux linkage constant from back-emf
- Skip
  - Determining inductance terms and magnet flux by inspection

Inverters
- Basic operation, line-to-ground, line-to-neutral, and line-to-line voltages
- 180 degree VSI, harmonic calculations
- Sine-triangle modulation, modulation index, third harmonic injection
- Hysteresis current regulation, maximum commanded current

Brushless Dc Drives
- Practical BDC motor example
- Current-regulated and voltage source BDC drive steady-state calculations

Induction Machines
- Per-phase steady-state circuit
- Steady-state calculations
- Simplified IM model
- Skip
  - Development of inductance equations
  - Referring rotor quantities to stator
  - Peak torque calculation

Induction Motor Drives
- V/Hz control
- Maximum efficiency control