Power Workshop 2009 - Electric Drive Track Summary

Emphasize the course as Electric Drive "System" course.

1. Motivation:
   a. Provide sample applications
   b. Use block diagram to show connections between system components (Fig. 1-3 is a good example. It can be viewed as a motor drive and a generator.)
   c. Add system level problems in each chapter to highlight the system concept.
2. Mechanical system (Chap 2)
   a. Does not have a clear and strong connection with other chapters in the book.
   b. Should better integrate it with the drive system.
3. Power electronics (Chap 4)
   a. Emphasize it as a system component.
   b. Animation can be used to show how to synthesize a Sinusoidal output by PWM
4. Basic machines (Chap 6, 7)
   a. Consider machines in both directions: motors and generators.
   b. To emphasize the system concept, the course, both transient and steady state responses for motors should be considered.
5. Control (Chap 8) – should consider some practical issues such as anti-windup and anti-aliasing filters.
6. General AC machines (Chap 9)
   a. Emphasize the concept of space vectors.
   b. Apply the space vector concept: synchronous motor $\rightarrow$ permanent magnet motor $\rightarrow$ synchronous generator
   c. The notations for space vectors and phasors are easy to get confused.
7. Discussions: induction motors and reluctance motors.
8. Improvements can be made in the book:
   a. Provide information of advantages and disadvantages of different types of motors in various applications.
   b. Illustrate motor winding structures as visual aides.

c. Include dynamic equations of different types of motors (in general number of poles) in appendix for the readers who are interested to learn how the motor models are derived.